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Eventful Years

VOLUME ONE
ABBREVIATIONS
to CONANT

A RECORD OF EVENTS
OF THE YEARS PRECEDING
INCLUDING AND FOLLOWING
WORLD WAR II

1937 THROUGH 1946

Prepared Under the Editorial Direction of
WALTER YUST
Editor of Encyclopædia Britannica



The University of Chicago

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INTRODUCTION

TEN EVENTFUL YEARS is the record of world events of the years 1937 through 1946. It is a report, in large part, by men and women who were active in shaping these events. It is history during that period written by those who made history.

TEN EVENTFUL YEARS is the work of more than 800 men and women from forty-five countries of the world. They have collaborated in the production of these volumes—harmoniously and with mutual respect. This should be some faint indication that peaceful collaboration between different nationalities is possible in more important matters.

These volumes do not constitute a completely objective encyclopaedia of the times. The volumes are the times. Contributions to them by eminent scientists, politicians, lawyers, generals, statesmen, and men and women of many different interests are often expressions of opinion. It was believed by the editors and publishers of these books that they might very well be so, for out of such varying points of view—often disputed—was fashioned the character and significance of the decade.

No decade, perhaps, in the march of man is so rich in startling changes in physical and spiritual aspects of living heretofore commonly accepted as more or less permanent. Words and their meanings from the mouths and pens of often selfish, cynical and power-drunk men became weapons of unexpected malignancy. The decade witnessed active war, but also peace, which was no peace. It witnessed, too, great scientific achievements, great sacrifices, courage and faith. Although astronomical expenditures were made for war, more money and effort than ever before were expended to help the starving and the homeless of the world.

In the four volumes are revealed the last ten years of nineteen hundred and forty-six years of the Christian era. One can see in this particular decade the pattern of all the other years which have gone before; and man's extraordinary progress seems to be only by the light of fallen cities. If his advances can be made only through turmoil and pain, the decade must hold hope for and promise of a better way of life throughout the world.

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- C. A. T. Spices
 C. A. Thayer. Former President and Former
 Director, American Spice Trade Association,
 New York, N.Y.
- C. B. C. Indiana (in part)
 Christopher B. Coleman. Former Director,
 Indiana State Historical Bureau, Indianapolis,
 Ind.
- C. B. H. Reconstruction Finance
 Corporation
 Charles B. Henderson. Chairman of the Board

Charles B. Henderson. Chairman of the Board of the Reconstruction Finance Corporation, Washington, D.C.

- C. B. S. Baltimore (in part); etc. Carl B. Swisher. Professor of Political Science, The Johns Hopkins University, Baltimore, Md. Author of The Growth of Constitutional Power in the United States; etc.
- C. C. C. Police (in part) Charles Craik Cunningham. Deputy Secretary, Scottish Home Department.
- C. C. L. Canada (in part)
 Charles Cecil Lingard. Editor, International
 Journal. Research Secretary, Canadian Institute of International Affairs, Toronto, Ont.
 Author of Territorial Government in Canada.
- C. Cn. Mongolia; etc. Chih-mai Chen. Counselor, Chinese Embassy, Washington, D.C. Author of Chinese Government and Politics; etc.
- C. Cs. Mississippi (in part)
 Charlotte Capers. Acting Director, Mississippi
 Department of Archives and History, Jackson,
 Miss. Associate Editor, Journal of Mississippi
 History.

- C. Cy. Canadian Literature; etc. C. J. Ho. Charles Clay. Director, Canadian Research and Editorial Institute, Ottawa, Ont. Author of Swampy Cree Legends; etc.
- C. D. Hu. Chemistry Charles D. Hurd. Professor of Chemistry, Northwestern University, Evanston, Ill.
- C. D. Sp. Insurance (in pair) Charles D. Spencer. Editor, Employee Benefit Insurance (in part) C. L. L. Plan Review.
- Brewing and Beer (in part) C. D. Williams. Secretary, United States Brewers Foundation Inc.
- Tennessee C. M. An. Charles E. Allred. Head, Department of Agricultural Economics and Rural Sociology, University of Tennessee, Knoxville, Tenn.
- Catholic Organizations for

Charles E. Bermingham. Director, Youth Department, National Catholic Welfare Conference, Washington, D.C.

- California (in part) Charles Edward Chapman. Former Professor of History, University of California, Berkeley, Calif.
- C. E. Fe. Vermont (in part) Clara E. Follette. Secretary and Assistant to the Director, Vermont Historical Society, Montpelier, Vt.
- Hiroshima Curtis Emerson LeMay. Major General, U.S.A. Deputy Chief of Air Staff for Research and Development, Headquarters, Army Air Forces, Washington, D.C.
- Forests (in part) C. E. Randall. Information Specialist, Division of Information and Education, Forest Service, U.S. Department of Agriculture, Washington, D.C.
- Railroads (in part) Charles Ely Rose Sherrington. Secretary, British Railways Research Service. Former Lecturer in Transport, London School of Economics, London University, London, Eng.
- F. Bs. Arkansas (in part)
 Clarence F. Byrns. Editor, Southwest Times Record, Fort Smith, Ark.
- F. D. Boxing (in part)
 C. F. Donmall. Former General Secretary, British Boxing Board of Control, London, Eng.
- Industrial Research C. F. Ke. Charles Franklin Kettering, Vice-President and Director, General Motors Corporation; General Manager, General Motors Research
- Pittsburgh Charles F. Lewis. Director, The Buhl Foundation, Pittsburgh, Pa.
- Libraries (in part) C. F. McC. Charles Flowers McCombs. Chief Bibliographer, New York Public Library, New York,
- C. G. M. Alimentary System, Disorders of (in part)

Carl Grismore Morlock, M.D. Consultant in Medicine, Mayo Clinic, Rochester, Minn. Assistant Professor of Medicine, Mayo Foundation, University of Minnesota, Rochester, Minn.

- Leprosy C. H. Binford, M.D. Senior Surgeon, U.S. Public Health Service. Pathologist, U.S. Marine Hospital, Baltimore, Md.
- . H. Cm. Hospitals (in part) Carl Hjalmar Cederström. Chief architect, Southern Hospital, Stockholm, Sweden.
- Charles J. Brand. Economic Consultant to the President, Davison Chemical Corporation, Baltimore, Md. Author of What Economic System For America? President, Agricultural History Society of U.S.A.

- Norway Carl Joachim Hambro. President of the Odelsthing, Oslo, Norway. Author of I Saw It Happen in Norway; etc.
- C. Kk. Truman, Harry S. Carroll Kilpatrick. Washington correspondent, The Chicago Sun, Washington, D.C.
- Wisconsin (in part) Clifford L. Lord. Director, State Historical Society, Madison, Wis.
- Tokyo (in part) Clark Lee. Author of They Call It Pacific; One Last Look Around; etc.
- Carleton M. Allen. Lecturer on Wool and Woollen Textiles, Boston University, Boston, Mass.
- C. M. Ce. Christopher Maude Chavasse. Bishop of Rochester, England.
- C. M. Pn. Industrial Health (in part) Carl M. Peterson, M.D. Secretary, Council on Industrial Health, American Medical AssociaD. B. L. tion.
- War and Defense Agencies (in part)

Conan Nicholas. Writer on economics and politics, London, Eng.

D. Bru.
David

- World War II (in part) C. P. Li. Chen Pu-Lai. Secretary-General to Generalis-simo Chiang Kai-shek. Deputy Secretary-General, Supreme Council of National Defense, Nanking, China. (Article prepared with the approval of Chiang Kai-shek.)
- C. P. R. Carlos Pena Romulo. Permanent Representative of the Republic of the Philippines to the United Nations. Author of I Saw the Fall of the Philippines; Mother America; etc.
- War Relief, U.S. C. P. T. Charles P. Taft. Chairman, U.S. Advisory Committee on Voluntary Foreign Aid, Washington, D.C. Author of City Management; The Cincinnati Experiment; You and 1—and Roosevelt.
- Federal Communications C. R. D. Commission

Charles Ruthven Denny. Chairman, Federal Communications Commission, Washington,

C. R. Hu. Tactics of World War II

Clarence Ralph Huebner. Major General, U.S.A. Deputy Commander, U.S. Army Forces in Europe.

C. R. Wd. Rural Electrification (in part)

Claude R. Wickard. Administrator, Rural Electrification Administration, U.S. Department of Agriculture, Washington, D.C.

- Fashions, Women's Carmel Snow. Editor of Harper's Bazaar, New York, N.Y.
- C. Ss. Alabama (in part) Chauncey Sparks. Governor of Alabama.
- C. S. T. Constantine Stavros Tsaldaris. Prime Minister of Greece.
- Strategic Bombing (in part) Carl Spaatz. Commanding General, U.S. Army Air Forces.
- V. U. World War II (in part) Cecil Vivian Usborne. Vice Admiral (retired). Author of Smoke on the Horizon; The Conquest of C. V. U. Morocco.
- C. W. Coates. Aquarist-Curator, New York Aquarium, New York, N.Y. C. W. C.
- C. W. Js. Tasmania Sir Claude Weymouth James. Agent-General Tasmania for Tasmania, London, Eng.
- Casper W. Ooms. Commissioner, U.S. Patents
 Office, Department of Commerce, Washington, D.C. C. W. O.

- C. W. Ra. Texas (in bart) Charles W. Ramsdell, Jr. Former Professor of History, University of Texas, Austin, Tex. Co-author of School History of Texas.
- C. W. S. Motor Transportation (in part)
 Carl W. Stocks. Editor, Bus Transportation, New York, N.Y.
- . W. Sr. Submarine Warfare (in part) Charles W. Styer, Rear Admiral, U.S.N. Assistant Chief of Naval Operations and Coor-dinator of Undersea Warfare, Navy Depart-C. W. Sr. Charles W. ment, Washington, D.C.
- Table Tennis Carl Zeisberg. Former President, United States Table Tennis Association.
- Church of England; etc. D. A. G. R. Building and Construction Industry (in part)
 Donald A. G. Reid. Principal, London County Council Brixton School of Building, London, Éng.
 - Dillard B. Lasseter. Administrator, Farmers Home Administration, U.S. Department of Agriculture, Washington, D.C.
 - David Brunt. Professor of Meteorology, Imperial College of Science and Technology, London, Eng. Author of Weather Study; etc.
 - David Barnard Steinman. Authority on the design and construction of long-span bridges.
 - D. C. H. J. Libraries (in part)
 D. C. Henrik Iones, Librarian and Informa-Libraries (in part) tion Officer, The Library Association, London,
 - Consumer Credit (in part) Duncan Carmichael. Director, United Do-minions Trust, Ltd., British Medical Finance, Ltd., United Dominions Trust Property Trust, Ltd; and Credit for Industry, Ltd.
 - C. Sn. Coast Guard, U.S. (in part)
 Dorothy Constance Stratton, Professor of Psy-D. C. Sn. chology and Dean of Women, Purdue University, Lafayette, Ind. Former Director, Women's Reserve of the United States Coast Guard.
 - de S. P. Jewish Religious Life David de Sola Pool. Rabbi, Spanish and Portuguese Svnagogue Shearith Israel, New York,
 - Employment; etc. D. D. L. Don D. Lescohier. Professor of Economics, University of Wisconsin, Madison, Wis. Au-thor of *The Labor Market*; etc.
 - D. D. W. South Carolina (in part) David Duncan Wallace. Professor of History and Economics, Wofford College, Spartanburg, S.C. Author of History of South Carolina; etc.
 - D. Dz. Atomic Bomb (in part) David Dietz. Science Editor, Scripps-Howard Newspapers. Lecturer in General Science, Western Reserve University, Cleveland, Ohio. Author of Atomic Energy in the Coming Era; etc.
 - D. F. Tr. Dorothea F. Turner. Assistant Professor in Medicine, Department of Medicine, The Uni-versity of Chicago, Chicago, Ill. Author of Diet Therapy Handbook.
 - D. G. Ds. Aqueducts (in part) Delwyn G. Davies. Water Engineer and Manager, Harrogate waterworks, Harrogate, Eng.
 - Theosophy D. Gs. Doris Groves. General Secretary, Theosophical Society in England.
 - Douglas G. Woolf. Former Editor-in-Chief, Textile World. Textile Consultant and Publisher, East Pasadena Herald, Pasadena, Calif.
 - Daniel Katz. Chairman, Department of Psychology, Brooklyn College, Brooklyn, N.Y.

- D. Kn. Women, Freedom of Dorothy Kenyon, D.J. Former Judge of the Municipal Court of the City of New York, N.Y.

 Edgar University
 - D. Ko. Chronology of Events, 1937-46 (in part); etc. David Karno. Former Assistant Foreign Editor, The Chicago Sun. Chicago, Ill.
 - D. L. Br. Words and Meanings, New (in part)
 Dwight L. Bolinger. Former Chairman of the
 New Words Committee of the American Dialect Society. Associate Professor of Spanish,
 University of Southern California, Los Angeles, Calif.
 - D. Lh. Tariffs
 David Lynch. Principal Economist, United
 States Tariff Commission. Author of The Concentration of Economic Power.
 - D. M. F.

 Dingle Mackintosh Foot. Barrister-at-Law.

 Co-author of Guide to the Road and Rail Traffic

 Act. 1933.

 Enri
 - D. M. Hd. Vitamins (in part)
 D. Mark Hegsted. Assistant Professor of Nutrition, Department of Nutrition, School of Public Health, Harvard University, Boston, Mass.
 - D. Mn. Salvation Army
 Donald McMillan. National Secretary of The
 Salvation Army.
 - D. Nn. London
 Lady Dorothy Nicholson. Author of Private
 Letters: Pagan and Christian; The Londoner; etc.
 - D. P. Portugal (in part)

 Domingos de Sousa Holstein Beck (5th Duke
 of Palmella). Portuguese Ambassador to the
 Court of St. James, London, Eng.
 - D. Rd. California (in part)

 Donald Rowland. Professor of Latin American
 History, University of Southern California,
 Los Angeles, Calif.
 - D. R. F. Cartoons
 Daniel Robert Fitzpatrick. Editorial cartoonist, St. Louis Post-Dispatch, St. Louis, Mo.
 - D. R. G. Football (in part)
 David Robert Gent. Rugby Football Critic,
 The Sunday Times, London, Eng.
 - D. Rn. Housing (in part); etc. Dorothy R. Rosenman (Mrs. Samuel I. Rosenman). Chairman, National Committee on Housing. Author of A Million Homes a Year.
 - D. Ro. South Dakota (in part)
 Doane Robinson. Secretary Emeritus, 1926–
 46, Historical Society, Pierre, South Dakota.

 Eloise
 Home
 - D. S. Mu. United States
 David Saville Muzzey. Emeritus Professor of
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 N.Y.
 - D. St. Advertising

 Daniel Starch. Consultant in Business Research. Former Lecturer and Professor at Harvard University and the University of Wisconsin. Author of Principles of Advertising; etc.

 E. E. Bs. Sir Edw to H.M. London, Wisconsin. Author of Principles of Advertising; E. E. Hs.
 - D. Wh. Geopolitics
 Derwent S. Whittlesey. Professor of Geography, Harvard University, Cambridge, Mass.
 Author of Earth and the State; German Strategy of World Conquest.
 - D. Y. T. Arkansas (in part)
 David Yancey Thomas. Emeritus Professor of
 the Department of History and Political
 Science, University of Arkansas, Fayetteville,
 Ark., 1940-43.
 - E. A. Gs.

 Elizabeth A. Groves.
 School of Librarianship, University of Washington, Seattle, Wash.
 - E. A. Js. Wake Island
 E. A. Junghans. Captain, U.S.N. Island Commander of Wake.

- E. A. Jz. Panamá (in part) E. G. Al. Enrique A. Jimenez. President of Panamá. Ellis Gil
- E. A. P. Madrid; etc.

 Edgar Allison Peers. Professor of Spanish,
 University of Liverpool, Liverpool, Eng. Author of A History of the Romantic Movement in
 Spain; etc.
- E. Bd. International Law
 Edwin Borchard. Professor of International
 Law, Yale University, New Haven, Conn.
 Author of Diplomatic Protection of Citizens
 Abroad; Declaratory Judgments; etc.
- E. By. Hotels (in part)
 Ernest Byfield. President, Hotel Sherman,
 Inc., Chicago, Ill.
- E. C. D. M. Nevada
 E. Charles D. Marriage. State Librarian,
 Nevada State Library, Carson City, Nev.
- E. C. Gr. Georgia (in part)
 E. C. Griffith. Associate Professor of Economics, Washington and Lee University, Lexington, Virginia.
- E. Ci. Italian Colonial Empire Enrico Cerulli. Counsellor of State, Italy. Author of The Folk Literature of the Galla of Southern Abyssinia; etc.
- E. Cra. Moscow; etc. Edward Crankshaw, Staff of British Military Mission, Moscow, U.S.S.R., 1941–43. Author of Russia and Britain; etc.
- E. C. Sd. World War II (in part)
 Edwin Colston Shepherd. Secretary General,
 Air League of the British Empire. Air correspondent, Sunday Times, London, Eng. Author
 of Great Flights; The Air Force Today.
- E. Cul. Contract Bridge E. J. Tr.
 Ely Culbertson. Editor, The Bridge World.
 President, World Federation, Inc. Author of
 Total Peace.

 Eugene
 York Ti
- Ed. El. Maryland (in part)
 Edgar Ellis, Librarian, The Sunpapers, Baltimore, Maryland.
- Cartoons al cartoon-Mo.

 E. D. F. Colorado (in part)

 Edward D. Foster. Former Director, Colorado
 State Planning Commission, Denver, Colorado.

 Elmer ican Colorado.
 - E. D. Fy. Liberia Elizabeth Dearmin Furbay (Mrs. J. H. Furbay). Author of "Top Hats and Tom-Toms" (Government Bulletin).
 - Ed. Mo.

 Edward Cardinal Mooney. Cardinal Archbishop of the Roman Catholic Archdiocese of Detroit.
 - E. Dn. Home Economics
 Eloise Davison. Director, Herald Tribune
 Home Institute, New York Herald Tribune, New
 York, N.Y.
 - E. E. B. Montana
 Edward E. Bennett. Professor of History,
 Montana State University, Missoula, Mont.
 - E. E. Bs. Civil Service (in part)
 Sir Edward E. Bridges. Permanent Secretary
 to H.M. Treasury, Secretary of the cabinet,
 London, Eng.
 - E. E. Hs. Central European and Balkan Literature (in part)
 Emil Euripide Hourmouzios. Editor of Kathimerini, Athens, Greece. Author of Kostes Palamas and His Time; Eugene O'Neill: An Iconoclast of the Theatre.
 - E. F. Bartelt. Fiscal Assistant Secretary, Treasury Department, Washington, D.C.
 - E. F. D. Maine (in part)
 Edward F. Dow. Professor of Government and
 Head of the Department of History and Government, University of Maine, Orono, Me.
 Trial Justice, Penobscot County, Me.
 - E. G. A. Hawaii (in part); etc.
 Edwin G. Arnold. Director, Division of Territories and Island Possessions, U.S. Department of the Interior, Washington, D.C.

 El R. Department of the Interior, Washington, D.C.

- E. G. Al. Ku Klux Klan Ellis Gibbs Arnall. Former Governor of the State of Georgia. Author of *The Shore Dimly Seen.*
- E. G. An.

 Estelle G. Anderson (Mrs. Arthur D. Anderson). Associate Editor, Boot and Shoe Recorder.
- E. Gn. Baltimore (in part); etc.
 Elmer Green. Author of The Making of
 Maryland.
- E. H. Co. Gold (in part)

 Edward H. Collins. Member, Editorial Board,

 New York Times, New York, N.Y. Author of

 Inflation and Your Money.
- E. H. Kr. Mineralogy
 Edward Henry Kraus. Dean Emeritus of the
 College of Literature, Science and the Arts,
 University of Michigan, Ann Arbor, Mich.
- **E. Ht.** France Edouard Herriot. Former Premier of France.
- E. I. F. Horticulture

 E. I. Farrington. Secretary, Massachusetts
 Horticultural Society and Editor of Horticul-
- E. J. C. Canning Industry
 Edwin J. Cameron. Director, Research Laboratories, National Canners Association.
- E. J. F.
 Sir Edgar John Forsdyke. Director and Principal Librarian, British Museum, London, Eng.
- E. J. Te. Minnesota (in part)
 Edward J. Thye. U.S. Senator. Former Governor of Minnesota.
- E. J. Tr. Rehabilitation of the Disabled (in part)
 Eugene J. Taylor. Editorial staff, The New York Times, New York, N.Y. Consultant in Medical Rehabilitation to the Veterans' Administration. Former Chief of Education, Army Air Forces Convalescent Services Pro-
- El. Br. Anti-Semitism; etc. Elmer Berger. Executive Director, The American Council for Judaism, Inc.

gram.

Em. G. C.

- Liberia
 H. Furm-Toms"

 E. L. Bs. Public Relations
 Edward L. Bernays. Counsel on Public Relations, New York, N.Y. Author of Crystallizing
 Public Opinion; Propaganda.
- Pius XI E. Lg. German Literature and Archadiocese of Emil Ludwig. Author of Bismarck; Gifts of Life; Leaders of Europe; Son of Man; The Nile; The Moral Conquest of Germany; etc.
 - E. L. R. St. Louis
 E. Lansing Ray. President and Editor, St. Louis Globe-Democrat, St. Louis, Mo.
 - Reconstruction and
 Development
 Emilio Gabriel Collado. U.S. Executive Director, International Bank for Reconstruction

International Bank for

- rector, International Bank for Reconstruction and Development, Washington, D.C.

 Em. H. Chiang Kai-shek: etc.
- Em. H. Chiang Kai-shek; etc.
 Emily Hahn (Mrs. Charles Boxer). Author of
 Soong Sisters; China to Me; Hong Kong Holiday;
 etc.

 E. M. M. Fires and Fire Losses (in part)
 Sir Edward Mortimer Mountain. Chairman
- Sir Edward Mortimer Mountain. Chairman and Managing Director, Eagle Star Insurance Company, Ltd., London, Eng.

 E. Mn. Pennsylvania (in part)
- Edward Martin. United States Senator (Pennsylvania), Washington, D.C.

 E. M. Wt.

 Iran

 Edward Miles Wicks Middle Fort Services
- E. M. Wt.

 Edwin Milton Wright. Middle East Specialist,
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 Lecturer on Near and Middle Eastern Problems, School for Advanced International
 Studies, Washington, D.C.
- E. Nn. Colorado (in part)

 El Roy Nelson. Regional Economist, U.S.

 Department of Commerce. Professor of Economics, University of Denver, Denver, Colo.

- E. N. v. K. Netherlands Eelco Nicolaas van Kleffens. Netherlands Minister for Foreign Affairs, 1939-46; Minister without portfolio, 1946- . Author of The without portfolio, 1946- . Rape of the Netherlands.
- Entomology Edward Oliver Essig. Head, Division of Ento-mology and Parasitology, University of California, Berkeley, Calif.
- Wisconsin (in part) Edward P. Alexander. Educational Director, Colonial Williamsburg, Williamsburg, Va. Author of A Revolutionary Conservative: James Duane of New York.
- E. P. J. Arthritis; etc. Edwin P. Jordan, M.D. Associate Editor, The Journal of the American Medical Association, Chicago, Ill. Editor, Standard Nomenclature of
- Family and Its Social Function.
- E. R. G. R. E. Air Raid Defense (in part); etc.
 Sir Edward Ratcliffe Garth Russell Evans. Chairman, Defense and World Security Committee, House of Lords, Westminster, London, Eng. Author of Keeping the Seas; South with Scott; etc.
- Insurance (in part) E. R. H. Edward R. Hardy. Secretary-Treasurer, Insurance Institute of America, New York, N.Y.
- South Africa, The Union of Eric Rosenthal. Author of Fall of Italian East Africa; Fortress on Sand; General de Wet, etc.
- Rt. Roosevelt, Franklin D. (in part)
 Anna Eleanor Roosevelt (Mrs. Franklin D.
 Roosevelt). U. S. Delegate to the United Nations. Author of It's Up to The Women; This is My Story; etc.
- Institutum Divi Thomae Elton S. Cook. Dean of Research, Institutum Divi Thomae, Cincinnati, Ohio.
- . Se. Book Publishing (in part)
 Edmond Segrave. Editor of The Bookseller, London, Eng.
- Ethiopia (in part) Estelle Sylvia Pankhurst. Editor and Proprietor, New Times and Ethiopia News. Author of The Suffragette Movement; The Home Front; etc.
- Kentucky (in part) Edward Tuthill. Professor of History, Univer- F. D. S. sity of Kentucky, Lexington, Ky., 1908-1945.
- Submarine Warfare (in part) Eli T. Reich. Instructor, Department of Ordnance and Gunnery, U.S. Naval Academy, F. E. C. Annapolis, Md.
- Agriculture (in part) Edgar Thomas. Lecturer and Advisory Officer in Agricultural Economics, University of Reading, Reading, Eng.
- World War II (in part) Edgar Trevor Williams. Chief Intelligence Officer to General Montgomery, North African Campaign, 1940-43. Director, Enforcement Division, Security Council, United Na-
- Economics (in part) Eugene Clark. Assistant Professor of Economics, Ohio Wesleyan University, Delaware, Ohio.
- Auckland E. V. D. E. V. Dumbleton. Managing Editor, Auckland Star, Auckland, N.Z.
- Rural Electrification (in part) Edward William Golding. Head, Rural Elec-trification Section, Electrical Research Asso-

- ciation, London, Eng. Author of Electrification of Agricultural and Rural Districts; etc. Reparations (World War II) F. J. B. Edwin W. Pauley. United States Representative, Allied Commission on Reparations.
- Spanish-American Literature Fernando Alegría. Lecturer, Department of Spanish and Portuguese, University of California, Berkeley, Calif. Author of *Ideas Esteticas de la Poesia Moderna*; etc.
- Electrical Industries (in part) Frederick Arthur Harper. Mechanical Engineer, London, Midland and Scottish Railway.
- F. A. McN. Air Raid Defense (in part)
 Frank A. McNamee, Jr. Colonel, U.S.A.
 Deputy director, Cooperative for American
 Remittances to Europe, Inc.
- Chicago, Im. Disease.

 E. P. Jo.

 E. P. Joslin, M.D. Professor Emeritus of Clinical Medicine, Harvard University Medical School; Medical Director, George F. Baker Clinic, New England Deaconess Hospital, Boston, Mass.

 **Teand Divorce (in part)*

 Professor

 Professor

 Frederick F. Painting and Sculpture, Chicago, Chicago, Ill.

 F. Ay.

 Rhodes Scholarships

 Frank Aydelotte. Director, The Institute for Advanced Study, Princeton, New Jersey. Author of Elizabethan Rogues and Vagabonds; The American Rhodes Scholarships: A Review of the American Rhodes Scholarships: A Review of the
 - F. B. M. British Legion Sir Frederick Barton Maurice. President, British Legion. Author of Robert E. Lee, the Soldier; The Adventures of Edward Wogan; etc.
 - F. Bow. . Bow. Los Angeles
 Fletcher Bowron. Mayor of the City of Los Angeles, Calif.
 - F. C. Bg. Bread and Bakery Products
 Franklin C. Bing. Director, American Institute of Baking.
 - C. Bo. Shipbuilding (in part); etc. Frank C. Bowen. Editor, Merchant Ships of the World. Author of The Golden Age of Sail; etc. F. C. Bo.
 - Art Exhibitions (in part) Francis Godfrey Goodwin. Editor, British Central Mediterranean Forces' Literary Quarterly, Highway Six.
 - F. C. W. Francis Carter Wood, M.D. Director of Laboratories, St. Luke's Hospital, New York, N.Y. Emeritus Director, Cancer Research, Columbia University, New York, N.Y.
 - Seventh-day Adventists Francis D. Nichol. Editor, Review and Herald. Author of The Midnight Cry; The Answer to Modern Religious Thinking; etc.
 - F. D. R. New Mexico Frank D. Reeve. Associate Professor of History, University of New Mexico, Albuquerque, N.M.
 - Finland; etc. Franklin D. Scott. Professor of History, North-western University, Evanston, Ill. Author of Bernadotte and the Fall of Napoleon; etc.
 - Business Review (in part); etc. Fred E. Clark. Morrison Professor of Marketing; Director of the Graduate Division, School of Commerce, Northwestern University, Evanston, Ill.
 - . E. J. War Crimes (in part)
 Frederick Elwyn Jones. Member of Parliament, Plaistow division of West Ham, London, F. E. J. Eng. Author of The Battle for Peace; The Attack from Within.
 - F. H. F. Air Conditioning F. Pt. F. H. Faust. Commercial Engineer, Air Conditioning and Commercial Refrigeration Department, General Electric Co., Bloomfield, N.J.
 - F. H. V. Netherlands Indies; etc. Frans H. Visman. Member of the Council of the Netherlands Indies, Batavia, 1936-41. Chairman of a commission to investigate the rolltical wishes of the Indies' people, Batavia, 1940-42. Adviser to the Netherlands Embassy, Washington, D.C.

- Relief Frank J. Bruno. Professor Emeritus, Applied Sociology and Chairman, Department of Social Work, Washington University, St. Louis, Mo.
- J. Se. Vitamins (in part)
 Frederick J. Stare, M.D. Associate Professor
 of Nutrition, Schools of Medicine and Public Health, Harvard University, Boston, Mass.
- Francis Cardinal Spellman. Cardinal Archbishop of the Roman Catholic Archdiocese of New York.
- F. J. W. Secret Service,
 Frank J. Wilson. Chief, United States Secret
 Police, Treasury Department, Washington,

F. L. F. Congregational Christian Churches

Frederick L. Fagley, D.D. Associate Secretary, General Council of the Congregational Chris-tian Churches. Author of An Outline of Church History; Co-author of History of American Congregationalism.

Jewish Welfare Board, Nationa

Frank L. Weil. President, The National Jewish Welfare Board. Vice-President, United Service Organizations, Inc.

- Guerrilla Warfare (in part) Fitzroy Maclean. Member of Parliament for Lancaster, Eng.
- Marine Biology . Francis Marsh Baldwin. Professor and Chairman, Biology Division; Sometime Director, Marine Biological Station, University of Southern California, Los Angeles, Calif.
- Unitarian Church Frederick May Eliot. President, American Unitarian Association.
- Accidents (in part) Franklin M. Kreml. Director, Northwestern University Traffic Institute, Evanston, Ill.
- M. Pr. Horse Racing (in part)
 F. M. Prior. Author of Register of Thoroughbred F. M. Pr. Stallions; etc.
- Insurance (in part) F. M. Roesing. Manager, Automobile Department, Continental Casualty Company, Chicago, Ill.
- F. M. V. T. Geology (in part) Francis M. Van Tuyl. Professor and Head of the Department of Geology, Colorado School of Mines, Golden, Colo.
- F. N. D. B. Oxford Group Frank N. D. Buchman. Leader of the Oxford Group. Author of Moral Rearmament; The Rise of a New Spirit.
- Frank Neumann. Chief, Section of Seismol gy, U.S. Coast and Geodetic Survey, U.S. Department of Commerce, Washington, D.C.
- World War II (in part) Frank Owen. Editor, Evening Standard, London, Eng., 1938-41. Author of The Three Dictators; The Campaign in Burma.
- Full name withheld at the request of the author.
- Navies of the World Fletcher Pratt. Author of The Navy: a History; The Navy's War; Fleet Against Japan; My Life to the Destroyers; etc.
- F. R. I. Electrical Industries (in part) Frank R. Innes. Associate Editor, Electrical World.
- Frederick Rothe. Former Chairman, Committee on Handball, New York Athletic Club, New York, N.Y.

- XVIII
- F. Ts. Friends, Religious Society of Frederick Tolles. Librarian, Friends Historical Library, Swarthmore College, Swarthmore, Pa.
- Fu. B. Cuba (in part)
 Fulgencio Batista y Zaldivar. Former President of Cuba. Author of Sombras de América.
- F. W. Ga. Utah (in part)
 Frederic William Ganzert. Former Associate
 Professor of History and Political Science, University of Utah, Salt Lake City, Utah.
- F. Whi. Mandates
 Freda White. Head of the Research Department, Daily Herald, and Odhams Press, London, Eng. Author of Abyssinian Dispute; War in Span; etc.
- F. W. N. Yeast
 Frederic W. Nordsiek. Assistant Director, Department of Applied Research, Standard
 Brands, Inc., New York, N.Y.
- F. W. Pk. British South African Protectorates

Frederick Walter Pick. Lecturer in Government, Co-operative College, Stanford Hall, near Loughborough, Eng. Author of Searchlight on German Africa; The Baltic Nations.

- F. W. Rr. Meteorology (in part)
 F. W. Reichelderfer. Chief, Weather Bureau,
 U.S. Department of Commerce, Washington,
 D.C.
- F. Ws. Newspapers and Magazines
 (in part)
 Francis Williams. Former Wartime Controller

Francis Williams. Former Wartime Controller of News and Censorship, Great Britain. Adviser on Public Relations to the Prime Minister. Author of Press, Parliament and People; Democracy's Battle; etc.

- G. A. Ro. Iron & Steel; etc. Gar A. Roush. Editor, Mineral Industry, New York, N.Y. Author of Strategic Mineral Supplies.
- G. A. Si. United Church of Canada Gordon A. Sisco, D.D. Secretary, The United Church of Canada.
- G. A. V. Rhodesia, Northern; etc. George Alexander Vine. Editorial Assistant, East Africa and Rhodesia.
- G. B. En. Alimentary System, Disorders of (in pat)
 George B. Eusterman, M.D. Senior Consultant in Medicine, Mayo Clinic, Rochester, Minn. Professor of Medicine, Mayo Foundation, University of Minnesota Graduate School, Minneapolis, Minn.
- G. C. MI. World War II (in part)
 George Catlett Marshall. General of the
 Army. Secretary of State, Washington, D.C.
 Former Chief of Staff, War Department,
 Washington, D.C.
- G. D. H. C. Labour Party, Great Britain; etc.
 George Douglas Howard Cole. Chichele Professor of Social and Political Theory, Oxford University, Oxford, Eng. Author of The World of Labour; Self-Government in Industry;
- G. E. A. Insurance (in part)
 George E. Allen. President, War Damage
 Corporation, Washington, D.C.

Guild Socialism Restated; etc.

- Ge. A. Japan
 George Atcheson, Jr. Former Chief, Diplomatic Section, General Headquarters, Supreme Commander for the Allied Powers; Former Deputy for the Supreme Commander, Chairman and U.S. member, Allied Council for Japan. Ambassador to Japan.
- Ge. B. Western Australia
 Geoffrey Burgoyne. Editor, The Daily News,
 Perth, Western Australia
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G. E. L. Ear, Nose and Throat,
Diseases of (in part)
George E. Lieberman, Instructor in Otolaryn-

George E. Lieberman. Instructor in Otolaryngology, University of Pennsylvania Medical School, Philadelphia, Pa.

G. F. Central European and Balkan Literature (in part)

Sir George Franckenstein. Former Austrian Minister to the Court of St. James, London, England.

- G-H. D. Belgium Georges-Henri Dumont. Editor, Vras. Author of Marse de Bourgogne; Léopold III, Roi des Belges; etc.
- G. H. H. International Court of Justice (in part); etc.
 Green H. Hackworth. Judge, International Court of Justice, Washington, D.C. Author of Digest of International Law.
- G. H. I. Compulsory Service, British Sir Godfrey Herbert Ince. Permanent Secretary, Ministry of Labour and National Service, London, Eng.
- G. I. Q. Archaeology (in part)
 George I. Quimby, Jr. Curator of Exhibits,
 Department of Anthropology, Chicago Natural
 History Museum, Chicago, Ill. Author of
 Aleutian Islanders; etc.
- G. J. B. F. Incendiary Warfare; etc. George J. B. Fisher. Colonel, Chemical Warfare Service, Army Service Forces.
- G. L. Bs. Radio (in part); etc. George Lisle Beers. Assistant Director of Engineering, RCA Victor Division of RCA, New York, N.Y.
- G. M. C. Ear, Nose and Throat,
 Diseases of (in part)

George Morrison Coates, M.D. Professor of Otorhinology, Graduate School of Medicine, University of Pennsylvania, Philadelphia, Pa.

- G. McA.

 Gilbert McAllister. Honorary Treasurer,
 Town and Country Planning Association, London, Eng. Author of Town and Country Planning; etc.
- G. M. Du. Connecticut (in part)
 George Matthew Dutcher. Professor of History, Emeritus, Wesleyan University, Middletown, Conn. Author of The Political Awakening of the East.
- G. M. Hy. Newspapers and Magazines (in part)
 Grant M. Hyde. Director, School of Journalism, University of Wisconsin, Madison, Wis.

G. Mis.

Gabriela Mistral. Chilean Consul at Los Angeles, Calif. Author of Desolacion; Tala.

- G. M. J. Interior Decoration
 G. McStay Jackson. President, McStay Jackson Co., Chicago, Ill.

 Harold Education
- G. M. M. Aviation, Civil Greer M. Murphy. Attorney, Civil Aeronautics Board, Washington, D.C.
- G. M. R. D. Sakhalin G. M. Richardson Dougall. Assistant Chief, War History Branch, Division of Historical Policy Research, Department of State, Washington, D.C.
- G. M. V. Zoology (in part)
 Geoffrey Marr Vevers. Superintendent, Zoological Gardens, London, Eng. Author of Life of the King Penguin; etc.

 H. C. Rd.
 Henry Cl
 versity of
- G. N. P.

 G. Neil Perry. Director, Bureau of Economics and Statistics, Province of British Columbia, Victoria, B.C.

 Hayne C. Gas Turb.

 Henry C. Henry C.
- G. P. T. Censorship (in part)
 George Pirie Thomson. Press Liaison Office,
 Cable and Wireless.
- G. R. B. Isle of Man
 Sir Geoffrey Rhodes Bromet. Lieutenant
 Governor of the Isle of Man.

- G. R. G.

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- G. R. Mn. British East Africa George Roy Morrison. Editorial Assistant, East Africa and Rhodesia. Author of Mixed Farming in East Africa.
- G. Sel. Stockholm
 Gösta Selling. Keeper of the City Archives of
 Stockholm, Sweden.
- G. Sg. Dutch Literature
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 Dutch Broadcasting Company, the Netherlands. Author of Erasmus; Rekenschap.
- G. W. Do. Pennsylvania (in part); etc.
 George W. Douglas. Former chief editorial
 writer, The Philadelphia Evening Public Ledger.
 Author of The Book of Days; etc.
- H. A. C.

 Howard A. Carter. Secretary, Council on Physical Medicine, American Medical Association.
- H. A. H.

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- H. A. Rk. Rehabilitation of the Disabled (in part)

Howard A. Rusk, M.D. Head of the Department of Rehabilitation and Physical Medicine, College of Medicine, New York University, New York, N.Y. Former Chief Convalescent Services Program, U.S. Army Air Forces.

- H. A. V. Food Supply and World
 War II (in part)
 Harold Aaron Vogel. Economist, Food and
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- tions.

 H. A. We. Consumer Credit (in part)
 Harold A. Wallace. Executive Vice-President,
- Associated Credit Bureaus of America, Inc.

 H. Bec. Sociology
 Howard Becker. Professor of Sociology, University of Wisconsin, Madison, Wis. Coauthor of Systematic Sociology; etc.
- H. Bm. Red Cross (in part)
 Howard Bonham. Vice-Chairman in charge
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- H. Bu. Epidemics and Public Health Control
 Herman N. Bundesen, M.D. President, Board of Health, Chicago, Ill. Author of *The Growing Child*: etc.
- H. C. Ce. Hotels (in part)
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- H. C. D. Education (in part)
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- H. Ce. Belgian Literature
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 La Métropole, Antwerp, Belgium. Author of
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- Sakhalin stant Chief, f Historical f Historicat tate, Wash- wash-
 - H. C. Rd. Delaware (in part)
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 - H. C. Tn. Insurance (in part)
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 - H. C. Wr. American Literature
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- H. Cy. Bank of England
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 Oxford, Eng. Author of The Problem of Industrial Relations; etc.
- H. de M. French Academy
 Henri de Montfort. Director of Administration, Institut de France, Paris, France. Author
 of Les Nouveaux Etats de la Ballique; etc.
- H. D. G.

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- H. D. W. International Monetary Fund (in part)
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ington, D.C.

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rector, National Farm Chemurgic Council.

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H. E. By. Surplus Property
Disposal, U.S.

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H. J. A.
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- He. C. Rivers and Harbours (in part)
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- He. L. M. Spanish Civil War
 Herbert Lionel Matthews. Chief of Bureau,
 The New York Times, London, Eng. Author of
 Eyewitness in Abyssinia; Two Wars and More to
 Come.
 Hom
- H. E. St. World Political Alignments,
 Postwar

Harold Edward Stassen. Former Governor of Minnesota. U.S. Delegate to San Francisco Conference of the United Nations.

H. F. An. Latvia; etc. Herbert Foster Anderson. Author of Borderline Russia; What I Saw in Poland.

H. F. Ms. European Advisory
Commission

H. Freeman Matthews. Director, Office of European Affairs, Department of State, Washington, D.C. Haro

- H. F. V. Housing (in part)

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- H. Fx. Dermatology
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 fessor
 Mass.
- H. G. C. Forests (in part)

 Harry George Champion. Professor of Forestry, Imperial Forestry Institute, Oxford, Eng. Author of Forest Types of India and Burma; etc.
- H. G. Do. Lumber (in part)

 Henry George Dodd. Chief Executive Officer,
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- H. G. M. Wildlife Conservation
 (in part)

Henry Gascoyen Maurice. President, Zoological Society of London, London, Eng. Secretary, Society for the Preservation of the Fauna of the Empire. Author of Sometimes an Angler.

H. G. Rn. India (in part); etc. H. L. St.
H. G. Rawlinson. Former Principal, Deccan
College, Poona, India.

Herbert
N.Y. A

- H. G. S. Shipbuilding (in part)
 Henry Gerrish Smith. President, Shipbuilders
 Council of America, New York, N.Y.
- H. H. A. Aviation, Military (in part)
 Henry H. Arnold. General, U.S.A. Former
 Commanding General, Army Air Forces
 (retired).
- H. H. Be. Soil Erosion and Soil
 Conservation

Hugh H. Bennett. Chief, Soil Conservation Service, U.S. Department of Agriculture, Washington, D.C.

- H. H. L. United Nations Relief and Rehabilitation Administration; etc. Herbert H. Lehman. Former Director General, United Nations Relief and Rehabilitation Administration, Washington, D.C.
- H. H. P. Indiana (in part)
 Howard H. Peckham. Director, Indiana Historical Bureau, Indianapolis, Ind.
- H. H. W. Motion Pictures (in part)
 Hans Henry Wollenberg. Joint Editor, Penguin Film Review; Editor, The London Film Correspondent, London, Eng. Author of Der Tonfilm; Der Film im Recht.
- H. J. A. Narcotics and Narcotic Traffic H. J. Anslinger. Commissioner of Narcotics, Treasury Department, Washington, D.C. Author of The Physician and the Federal Narcotic Law.
- H. J. De. Washington (in part)
 Herman J. Deutsch. Professor of History,
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- H. Jo. Federal Deposit Insurance Corporation

Homer Jones. Chief, Division of Research and Statistics, Federal Deposit Insurance Corporation, Washington, D.C.

H. Js. Town and Regional Planning; etc.

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- H. J. Sd. Suez Canal Hugh Joseph Schonfield. Director of Herbert Joseph Ltd., London, Eng. President, Service-Nation Movement. Author of Richard Burton: Explorer; Ferdinand de Lesseps; etc.
- H. Ke. New York (in part)
 Harold Keller. Deputy Commissioner and
 Director of State Publicity, Department of
 Commerce, State of New York, Albany, N.Y.
- H. K. L. Oslo

 Herman Kristofer Lehmkuhl. Press counsellor
 of the Royal Norwegian Embassy, London,
 Eng. Author of Hiller Attacks Norway.

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- H. Ko. Communism; etc.
 Hans Kohn. Sydenham Clark Parsons Professor of History, Smith College, Northampton,
 Mass. Author of The Idea of Nationalism, a
 Sludy of Its Origins and Background; etc.
- H. Ks. Chambers of Commerce (in part)
 Henry Kearns. President, The United States
 Junior Chamber of Commerce.
- H. L. G. Air Transport Command
 Harold L. George. Lieutenant General,
 U.S.A. Commanding General, Air Transport
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 D.C.
- H. L. Jn. Spanish Literature
 Harvey L. Johnson. Associate Professor, Department of Romance Languages. Northwestern University, Evanston, Ill.
- H. L. Sa. Patents (in part)
 Sir Harold Leonard Saunders. Comptrollergeneral of the Patent Office, London, Eng.
- H. L. St. Motor-Boat Racing; etc. Herbert L. Stone. Editor, Yachting, New York, N.Y. Author of America's Cup Races; etc.

- H. L. Tl. Rubber Harlan L. Trumbull. Assistant to the Director of Research, The B. F. Goodrich Co., Akron, Ohio.
- H. McN. Glasgow Sir Hector McNeill. Lord Provost of the City of Glasgow, Scotland.
- H. M. Sh. Mussolini, Benito; etc. Howard McGaw Smyth. Historian, Historical Division, War Department Special Staff, Washington, D.C.
- H. M. Sm. Iwo Jima
 Holland McTyeire Smith. General, U.S.
 Marine Corps (retired).
- H. M. Wn. World War II (in part)
 Lord Henry Maitland Wilson. Head, British
 Joint Staff Mission, Washington, D.C., 1944.
- H. M. Wr. Infantile Paralysis (in part) H. M. Weaver. Director of Research, National Foundation for Infantile Paralysis, New York, N.Y.
- H. P. D. Religion; etc. Harlan Paul Douglass, D.D. Editor, Christendom. Author of A Decade of Objective Progress in Church Unity; etc.
- H. Pn. Stocks and Bonds (in part)
 Hargreaves Parkinson. Editor, Financial
 Times, London, Eng. Author of The Small
 Investor; Ordinary Shares; etc.
- H. P. S. Copenhagen
 Hans Peter Sørensen. Chief Mayor of Copenhagen. Denmark
- hagen, Denmark.

 H. R. G.

 Airports and Flying
 Fields (in part)

Harold Roderick Gillman. Secretary, Aerodrome Owners' Association and the British Air Charter Association.

H. R. Ty. Food Supply and World War II (in part)

Howard R. Tolley. Chief Economist, Food and Agriculture Organization of the United Nations. Author of Farmer Citizen at War.

- H. R. V. Psychiatry
 Henry R. Viets, M.D. Lecturer on Neurology,
 Harvard Medical School. Neurologist, Massachusetts General Hospital. Librarian, Boston
 Medical Library, Boston, Mass.
- H. S. A. Cricket
 Harry Surtees Altham. Housemaster, Winchester College, Winchester, Eng. Author of
 History of Cricket.
- H. S. B. Atomic Bomb (in part)
 Harrison Scott Brown. Assistant Professor,
 Institute for Nuclear Studies, The University
 of Chicago, Chicago, Ill. Author of Must
 Destruction Be Our Destiny?
- H. S. C. E. Public Utilities (in part)
 Harry Stirling Cecil Everard. Personal assistant to the Governor of the Gas Light and Coke
 Co., London, Eng. Co-author of Report on a
 Survey of the Gas Industry in Great Britain.
- H. S. D. Egypt
 Herbert Stanley Deighton. Fellow and Dean
 of Pembroke College, Oxford, Eng. Visiting
 professor in Mcdern History, Cairo University,
 Cairo, Egypt, 1941–46.
- H. Sr. Poland
 Henryk Strasburger. Minister of Finance,
 Industry and Commerce, 1939-42. Polish
 Ambassador to Great Britain, 1945-46. Author of The Case of Danzig; Foreign Trade in the
 Service of National Economy.
- H. S. S. South Dakota (in part)
 Herbert S. Schell. Professor of American History and Director of the Graduate School,
 University of South Dakota, Vermillion, S.D.
 Author of South Dakota, Its Beginnings and
 Growth.

- I. T. Soap, Perfumery and Cosmetics Henry Tetlow. Henry Tetlow Company, Washington, D.C. XX
 - Women's Airforce Service H. Ta. Pilots

Hazel Clark Taylor. Director, Women's Interest, A.A.F. and WASP Public Relations; A.A.F. Group, Bureau of Public Relations, War Department, Washington, D.C.

- Massachusetts (in part) Henry T. Claus. Editor and publisher, Boston Evening Transcript, Boston, Mass., 1925-39. President, News-Journal Company, Wilmington, Del.
- H. T. Dg. Decorations, Military, Naval

and Civil (in part)
Henry Taprell Dorling. Captain, R.N. (retired). Author of Ribbons and Medals; Swept Channels; etc.

- Hu. L Manchester Hugh Lee. Lord Mayor of Manchester, England.
- H. V. E. Peace Negotiations, World War II (in part)

Herbert V. Evatt. Minister for External Affairs, Commonwealth of Australia, Canberra, Australia.

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Herbert Victor Johnson. Minister for the Interior of the Commonwealth of Australia.

- H. W. L.
 Harry W. Laidler. Socialism (in part) Executive Director, J. A. S. R. League for Industrial Democracy.
- Tunnels Harold W. Richardson. Executive Editor, Construction Methods.
- Wildlife Conservation J. B. Bd. (ın part)

Howard Zahniser. Executive Secretary, The Wilderness Society. Editor of The Living Wilderness.

- A. P. Brewing and Beer (in part)
 Isaac Arthur Preece. Lecturer in Biochemistry, Heriot-Watt College, Edinburgh, Scotlepp. R
- **Gg.** Post Office (in part) Isaac Gregg. Former Director of Press Relations, Office of the Postmaster General, Wash-I. Gg. ington, D.C.
- I. I. Turkey Ismet Inönü. President of Turkey.
- Linen and Flax; etc. Irene L. Blunt. Secretary, The National Federation of Textiles, Inc., New York, N.Y.
- Education (in part) Isaac Leon Kandel. Professor of Education. Teachers College, Columbia University, New York, N.Y. Editor, Educational Yearbook
- Parliament, Houses of J. C. Ar. Irene Mary Bewick Ward. Former member of Parliament (Conservative), Wallsend-on-Tyne, Northumberland, Eng.
- British Women's Services, World War II (in part) I. M. M. J. Inez Mary Mackay Jenkins. Chief Administrative Officer, Women's Land Army, England.
- Sd. Arabia (in part) Abdul Aziz Ibu Ibn Sa'ud. King of Saudi J. C. L. G. Arabia.
- I. Sr. Book Publishing (in part) Isidor Schneider. Former Literary Editor, New Masses. Author of The Judas Time; From the Kingdom of Necessity; etc.
- V. Radio (in part) J. C. Ms. Igor Vinogradoff. British Broadcasting Company Secretariat. Co-author of The Shadow of and Vict

- Farm Credit Administration I. W. D. I. W. Duggan. Governor, Farm Credit Administration, U.S. Department of Agriculture, Washington, D.C.
- I. W. R. Words and Meanings, New (in part) I. Willis Russell. Chairman of the Research Committee on New Words of the American Dialect Society. The Committee, which assisted In preparing the article, consisted of: Henry Alexander, C. L. Barnhart, Atcheson L. Hench, A. H. Marckwardt, Mamie J. Meredith, Peter Tamony, Harold Wentworth and Thomas A Knott.
- J. A. A. P. Accidents (in part) Jocelyn Arthur Adair Pickard. General Secretary, Royal Society for the Prevention of Accidents, London, Eng.

Thomas A. Knott.

- Furniture Industry J. A. Gary. Editor, Furniture Age, Chicago, I.l.
- Montreal J. En. I. Arthur Mathewson. Of Mathewson and Smith, Barristers, Montreal, Que.
- J. A. Mi. Electric Transportation J. E. Sh.

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- J. A. My. Tuberculosis J. A. Myers, M.D. Professor of Medicine and Preventive Medicine and Public Health, University of Minnesota Medical School, Minneapolis, Minn. Author of Man's Greatest Victory over Tuberculosis; etc.
- Coal (in part) J. A. S. Ritson. Professor of Mining, Royal School of Mines, South Kensington, Eng. Member of Council of the Institutions of Mining and Metallurgy and Mining Engineers, London, Eng.
- Airports and Flying Fields (in part)

J. B. Bayard, Jr. Director, Airport Division, Horner & Shifrin and Smith, Hinchman & Grylls, Inc.

Commodity Credit Corporation

John B. Hutson. Former president, Com-modity Credit Corporation. Assistant Secretary-General for Administration and Finance, United Nations.

Book-Collecting and Book Prices J. Bk.

Jacob Blanck. Editor, Bibliography of American Literature. Author of Peter Parley to Penrod; etc.

- Connecticut (in part) James Brewster. State Librarian, Connecticut State Library, Hartford, Conn.
- J. B. Sn. Textile Industry (in part) John Bamber Speakman. Professor of Textile Industries, Leeds University, Leeds, Eng.

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 John H. Head of
- Utah (in part) J. Cecil Alter. Senior Meteorologist, U.S. Weather Bureau. Historian and Editor, Utah State Historical Society. Author of Utah, the Storied Domain; etc.
- New Deal (in part)
- Coventry John Charles Lee Gordon. Mayor of Coven- J. I. F. try, 1945-46.
- J. C. Mn. Kansas (in part) James C. Malin. Professor of History, Univer- J. J. Dn. sity of Kansas, Lawrence, Kan.
- Agriculture (in part); etc. J. Clyde Marquis. American Representative J. J. Kt. and Vice-President, International Institute of James Agriculture, Rome, Italy, 1935-41. Former

Director of Economic Information, U.S. Department of Agriculture, Washington, D.C.

- John E. Briggs. Professor of Political Science, State University of Iowa, Iowa City, Ia.
- Federal Bureau of Investigation

J. Edgar Hoover. Director, Federal Bureau of Investigation, U.S. Department of Justice, Washington, D.C.

J. E. Hu. Strategy of World War II

(in part)
John E. Hull. Lieutenant General, U.S.A.
Commanding General, Army Forces, Middle
Pacific. Pacific.

- e. L. Special Areas, British Jennie Lee. Member of Parliament (Cannock Division), Staffordshire, Eng. Author of Tomorrow Is a New Day; This Great Journey; etc.
- Delaware (in part) Jeannette Eckman. Editor, Delaware, A Guide to the First State.
- Malayan Union; etc. Sir John Evelyn Shuckburgh. Deputy Under-secretary of State, British Colonial Office (retired).
- J. E. Wt. Evangelicals, National Association of

Elwin Wright. Executive Secretary, National Association of Evangelicals, Boston, Mass.

- George VI J. F. Ge. John Francis Gore. Author of Charles Gore; Sydney Holland; Nelson's Hardy; Creevey's Life and Times; King George V.
- J. F. Le. English Literature John F. Lehmann. Founder and Editor of New Writing and Daylight, London, Eng. Author of The Noise of History; Forty Poems; etc.
- J. G. F. Poetry John Gould Fletcher. Author of Selected Poems: South Star; The Burning Mountain; etc.
- G. Fo. Elections (in part)
 John Galway Foster. Conservative M.P. for
 Northwich Division of Cheshire, Eng. Author of Some Problems of English Private International
- J. G. Mk. Czechoslovakia (in part) Jan Garrigue Masaryk. Minister of Foreign Affairs, Czechoslovak government. Former minister of Czechoslovakia to Great Britain. Author of Speaking to My Country.
- J. H. Hg. Allied Control Organization for Japan

John H. Hilldring. Major General, U.S.A. Assistant Secretary of State for Occupied Areas.

- Palaeontology (in part) John H. Hoskins. Professor of Botany and Head of Department, University of Cincinnati, Cincinnati, Ohio. Former Chairman, Paleobotanical section, Botanical Society of America.
- J. H. Jn. Estonia: etc. John Hampden Jackson. Tutor in International Affairs, Cambridge University, Cambridge, Eng. Author of Finland; Estonia.
- John Rensselaer Chamberlain. Senior writer; Life Magazine, Washington, D.C. Author of The American Stakes; Farewell to Reform.

 J. H. Ms. Business Review (in part); etc. John H. Meyers. Associate Professor of Business Statistics, Northwestern University, Evanston, Ill.
 - Edinburgh John Ireland Falconer. Lord Provost of Glasgow, Scotland.
 - Civil Service (in part) J. J. Donovan. Associate Director, Civil Service Assembly of the United States and Canada.
 - Virginia (in part) James J. Kilpatrick. Staff writer, The Richmond News Leader, Richmond, Va.

- J. J. McC. J. McC. World War II (in part)
 John Jay McCloy. Assistant Secretary of War,
 War Department, Washington, D.C., 1941-45.
- J. J. McE. Civilian Conservation Corps James Joseph McEntee. International Representative, International Association of Machinists. Author of Now They Are Men—The Story of the Conservation Corps.
- J. J. Mg. Seabees John Joseph Manning. Rear Admiral, (C.E.C.) U.S.N. Chief of Civil Engineers of the United States Navy, Chief of the Bureau of Yards and Docks, Navy Department, Washington, D.C.
- Public Utilities (in part) J. Kd. Julius Kennard. Consulting engineer, specializing in water supply, Edward Sandeman, Kennard & Partners, Westminster, Eng.
- J. Ki. John Kieran. Editor, Information Please Almanac. Author of The American Sporting Scene; J. P-Br. Story of the Olympic Games; Nature Notes.
- Roman Catholic Church; etc. John LaFarge, S.J. Editor in Chief, America, National Catholic Weekly, New York, N.Y.
- Tactics of World War II
 - Jacob Loucks Devers. Commanding General, Army Ground Forces, Washington, D.C.
- Telegraphy
 The Western Joseph L. Egan. President, The Western Union Telegraph Company, New York, N.Y.
- L. F. Printing (in part)
 J. L. Frazier. Editor and Manager, The Inland
 Printer. Author of Modern Type Display: Type
- Horse Racing (in part) John L. Hervey. Author of Racing in America; American Race Horses; The Old Gray Mare of Long Island; etc.
- J. L. J.
 J. L. Johnston. Librarian, Provincial Library,
 Winnipeg, Man.
- Humour, War J. R. Cl. Juliet Lowell. Author of Dumb-Belle Lettres; Dear Sir.
- French Literature Jean Paul Malaquais. Author of Men From Nowhere; War Diary.
- West Virginia (in part) J. M. Ca. James Morton Callahan. Research Professor of History, West Virginia University, Morgan-town, W. Va. Author of American Foreign Policy in Mexican Relations; American Foreign Policy in Canadian Relations.
- J. McAt. Social Security (in part)
 John McDougall McAlmont. Member of
 British Civil Service.
- M. L. Florida (in part)
 James Miller Leake. Professor of History and
 Political Science, University of Florida, GainesThe Flating Fla
- John Mackay-Mure. Editor, Unwerstites Quarterly; Editor in Chief, Turnstile Press. Author of Education for What?; Adult Education: A Study in Transition.
- Portuguese Colonial J. Sc. J. M. R. D. S. Empire

Jose Maria Ribeiro Da Silva. Principal Secretary to the Minister for the Colonies, Portugal.

- Corregidor Jonathan Mayhew Wainwright. Commanding General, 4th U.S.A., Fort 8am Houston, Texas. Commanding General at fall of Corregidor, May 1942. Author of General Wainwright's Story.
- . M. Wr. Palaeontology (in part) J. James Marvin Weller. Professor of Invertebrate Palaeontology, The University of Chicago, J. M. Wr.

- Chicago, Ill. Author of Geology of Edmonson County, Kentucky.
- Radio (in part) John Nathan Bailey. Associate Editor, Broadcasting Publications Inc., Washington, D.C.
- Ethical Culture Movement Jerome Nathanson. Leader, New York Society for Ethical Culture, New York, N.Y. Author of Forerunners of Freedom.
- Jo. M. Electronics John Markus. Associate Editor, Electronics, New York, N.Y. Co-author of Electronics for Engineers; etc.
- J. Pal. Women's Reserve of the U.S.

Jean T. Palmer. Captain, Women's Reserve, U.S.N.R. Director, Women's Reserve of the U.S. Naval Reserve.

- League of Nations Joseph Paul-Boncour. Member, French Conseil de la Republique. Permanent French delegate at League of Nations, 1932-36. Author of Entre Deux Guerres; Souvenirs sur la 3^{me} Republique.
- P. D. Boxing (in part)
 James P. Dawson. Writer on baseball and boxing, The New York Times, New York, N.Y.
- J. P. Ht. Fairs, Exhibitions, Expositions John Parker Hunt. Executive Secretary, Detroit World's Fair Fact Finding Committee, Detroit, Michigan.
- J. P. J. Donations and Bequests (in part) John Price Jones. President and Treasurer, The John Price Jones Corporation, New York, N.Y. Author of The Yearbook of Philanthropy.
- J. P. Lm. Municipal Government
 - (in bart) Lord J. P. Latham. Leader of the London County Council, London, Eng.
- Pacific Islands, British; etc. Josephine Ramage. Assistant Librarian, London School of Economics and Political Science,
- Mormons J. Reuben Clark, Jr. First Counselor in the First Presidency, Church of Jesus Christ of Latter-Day Saints, Salt Lake City, Utah.
- Venereal Diseases J. R. Heller, Jr., M.D. Medical Director; Chief, Venereal Disease Division, U.S. Public Health Service, Washington, D.C.
- J. R. J.

 James R. Joy. Librarian and Historian, The Methodist Historical Society in the City of Methodist Church New York, New York, N.Y.
- Jane Marie Russell (Mrs. Frederick B. Russell) Jane Marie Russell (Mrs. Frederick B. Russell). Research Assistant, Division of International Educational Relations, U.S. Office of Educa-tion, Federal Security Agency, Washington, D.C.
- John Stewart Bryan. Former President and Publisher, Richmond Times Dispatch and The Richmond News Leader, Richmond, Va.
- Wisconsin (in part) Joseph Schafer. Former Superintendent of the State Historical Society of Wisconsin.
- Anaesthesiology John S. Lundy, M.D. Professor of Anaesthesiology, University of Minnesota Graduate School, Minneapolis, Minn. Head, Section on Anaesthesiology, Mayo Clinic, Rochester.
- Radar James Stokley. Author of Science Remakes Our World; Electrons in Action.

- J. T. Ar. Etching
 John Taylor Arms. President, Society of
 American Etchers. First Vice-President, National Academy of Design. Author of Hand-Book of Print Making and Print Makers; etc.
- J. T. McN. Allied Control Council for Germany

Joseph Taggart McNarney. General, U.S.A. Former Commander of U.S. Forces in Europe.

- J. War Production (in part) James William Fesler. Professor of Political Science and Research Professor, Institute for Research in Social Science, University of North Carolina, Chapel Hill, N.C. Former War Pro-duction Board Historian, Civilian Production Administration. Author of *The Independence of* State Regulatory Agencies; etc.
- W. Je. Federal Power Commission John W. Jenkins. Information Division, Federal Power Commission, Washington, D.C.
- Y. B. Banking (in part); etc. John Yocum Beaty. Editor, Bankers Monthly, Chicago, Ill. Author of How to Understand Banks; etc.
- Central European and Balkan Literature (in part) Kazimierz Czachowski. Former Director of the Department of Literature in the Polish Ministry of Culture and Art. Chairman of the Professional Union of Polish Writers.
- K. F. L. Child Welfare Katharine F. Lenroot. Chief, Children's Bureau, U.S. Department of Labor, Washington, D.C.
- K. Ged. Denmark Knud Gedde. Managing Director, Danish Youth Cooperative, 1940-44. Member of the board of directors of the Conservative Youth . Associate Editor, De Movement, 1930fem lange Aar.
- Tennessee Valley Authority K. R. K. Kenneth R. Kennedy. Assistant Chief, Information Service Staff, Tennessee Valley Authority, Knoxville, Tenn.
- . S. L. Missions, Foreign Kenneth Scott Latourette, D.D. Professor of Missions and Oriental History, Yale University, New Haven, Conn.
- Kazimierz Smogorzewski. Polish journalist in Paris, Berlin, etc. Founder and Editor, Free Europe.
- Austria (in part) Kurt von Schuschnigg. Former Austrian Chancellor. Author of Dreimal Österreich; Re-
- L. A. L. Insurance (in part) Leroy A. Lincoln. President, Metropolitan Life Insurance Company, New York, N.Y.
- A. M. Veterinary Medicine
 Louis A. Merillat, M.D.V., V.S. Editor, Journal of the American Veterinary Medical Association
 and American Journal of Veterinary Research.
 Author of Veterinary Military History of the United States.
- L. A. McA. Oregon (in part) Lewis A. McArthur. Vice-President and Di-rector, Oregon Historical Society, Portland, Ore. Member and Secretary, Oregon Geographic Board. Author of Oregon Place Names;
- Church Membership (in part); etc. Luther Allan Weigle, D.D. Dean of the Divinity School, Yale University, New Haven, Conn.
 - Minnesota (in part) Lewis Beeson. Former Acting Superintendent, Minnesota Historical Society, St. Paul, Minn. Author of Boyhood at Fort Snelling.

- XXII
- Selective Service, U.S. Lewis B. Hershey. Major General, U.S.A. Director, Bureau of Selective Service, Washing-L. Kn. ton, D.C.
- Australian Literature L. C. Key. Liaison Officer, Commonwealth National Library, Canberra, Australia.
- Louis Carter Smith. Secretary-Treasurer, National Archery Association of the United States.
- L. de B. H. L. de Breda Handley. Honorary Coach, Women's Swimming Association of New York. Au- L. Mh. thor of Swimming for Women; etc.
- Detroit Lent D. Upson. Dean, School of Public Affairs and Social Work, Wayne University, Detroit, Mich.
- Delaware (in part)
 Leon de Valinger, Jr. State Archivist, the
 Public Archives Commission, State of Delaware, Dover, Del. Author of Catalog of DelaL. M. W. ware Portraits.
- Billiards Louis Effrat. Member of sports staff, The New L. York Times, New York, N.Y.
- Exploration, Polar (in part) Lincoln Ellsworth. Explorer. Author of Be-yond Horizons; Last Wild Buffalo Hunt; Search. Co-author of First Crossing of the Polar Sea.
- Prisons (in part) Lewis E. Lawes. Former Warden, Sing Sing Prison, Ossining, N.Y. Former Chief Business Consultant, Prison War Program Branch, War Production Board, New York, N.Y.
- Census Data, U.S. Leon E. Truesdell. Chief, Population Division, United States Bureau of the Census, Washington, D.C. Author of Farm Population of the U.S.; The Canadian Born in the United States; etc.
- L. F. K. United Service Organizations Lindsley F. Kimball. President, United Service Organizations, Inc.
- . G. G. R. National Trust, British Leonard Gerald Gwynne Ramsey. Public Re-lations officer, the National Trust, London, L. G. G. R.
- Motor Transportation (in part) Laurie Gupwell. Chairman, A. J. Gupwell (Transport) Ltd., London, Eng.
- L. Gu. Municipal Government (in part)
 Luther Gulick. Director, Institute of Public Administration, New York, N.Y.
- Michigan (in part) Lewis George Vander Velde. Professor of History and Director of the Michigan Historical Collections, University of Michigan, Ann Arbor, Mich.
- Illinois (in part); etc. Lewis Harper Leech. Editorial writer, Chicago Daily News, Chicago, Ill. Author of The Paradox of Plenty; etc.
- L. Ho. Coinage (in part) Leland Howard. Acting Director of the United States Mint, Washington, D.C.
- Queensland Leonard Henry Pike. Agent General for L. W. F. Queensland.
- L. J. Br. Standards, National Bureau of Lyman J. Briggs. Former director, National Bureau of Standards, U.S. Department of Commerce, Washington, D.C.

 Sioners Modern

 L. W. L.

 Lane W
- L. J. L. Strategy of World War II (in part)
 Lawrence Joseph Lincoln. Colonel, U.S.A.
 Member of the U.S.-Soviet Joint Commission,

- K. F. South Dakota (in part) M. Ab. Lawrence Keith Fox. Former Secretary, State Historical Society of South Dakota, Pierre, Milton South Dakota.
- Wisconsin (in part) Louis Kaplan. Associate Librarian, University of Wisconsin, Madison, Wis. Author of Research Materials in the Social Sciences.
- Idaho (in bart) L. Md. La Moyne Mayfield. Public Accountant, Boise, Idaho.
- Leonard M. Fanning. Author of American Oil M. B. E. Operations Abroad; etc.
- Dance (in part) Lucile Marsh. Director, National Dance League. Author of The Dance in Education; Textbook of Social Dancing; etc.
- Dentistry Leroy M. S. Miner, D.M.D., M.D. Professor of Oral Surgery, Harvard University; Former Professor of Stomatology, Boston University, Boston, Mass.
- Alaska (in part) Lew M. Williams. Secretary of Alaska, Department of the Interior, Juneau, Alaska.
- Water Power Leland Olds. Chairman, Federal Power Commission, Washington, D.C.
- Coast and Geodetic

Survey, U.S. Leo Otis Colbert. Rear Admiral, U.S.C.&G.S. Director, U.S. Coast and Geodetic Survey. Department of Commerce, Washington, D.C.

- Motion Pictures (in part) Louella O. Parsons. Motion Picture Editor, International News Service. Author of The Gay Illiterate; How to Write in the Movies.
- War Production (in part) M. F. C. Laszlo Rostas. Research Associate of the National Institute of Economic and Social Research. Co-author of The Taxation of War Wealth; Productivity, Prices and Distribution in Selected British Industries.
- . S. C. Zoology (in part)
 Lee Saunders Crandall. General Curator, L. S. C. New York Zoological Park, New York, N.Y. Author of Paradise Quest; Pets and How to Care for Them.
- L. SI. . SI. Massachusetts (in part) Leverett Saltonstall. United States Senator. Former Governor of Massachusetts. Overseer of Harvard University, Cambridge, Mass.
- Pan American Union L. S. Rowe. Director General, Pan American Union, Washington, D.C.
- L. T. C. Lend-Lease Leo T. Crowley. Chairman, Standard Gas Electric Company, Chicago, Ill. Former Ad-ministrator, Foreign Economic Administra-tion, Washington, D.C.
- Russian Literature (in part) Leonid Timofeyev. Professor, Moscow University, Moscow, U.S.S.R. Author of Contemporary Literature.
- L. W. D. Vermont (in part) Leon W. Dean. Assistant Professor of English and Vermont History, University of Vermont, Burlington, Vt. Author of Stark of the North Country; Old Wolf; Green Mountain Boy; etc. Marguer
- Prisons (in part) Lionel Wray Fox. Chairman, Prison Commissioners for England and Wales. Author of The M. Ha. Modern English Prison.
- Nebraska Lane W. Lancaster. Professor of Political Science, University of Nebraska, Lincoln, Neb.
- Labour Unions (in part) Leo Wolman. Professor of Economics, Columbia University, New York, N.Y. Author of Ebb and Flow in Trade Unionism; etc.

Foreign Investments in the United States

Milton Abelson. Economic Analyst, Bureau of Foreign and Domestic Commerce, Department of Commerce, Washington, D.C.

- Television (in part) M. A. C. G. Maurice Anthony Coneys Gorham. Head of Television Service, British Broadcasting Corporation, London, Eng. Co-author of The
- Miguel Alemán Valdes. President of Mexico.
- British Women's Services, World War II (in part)

Mary Baxter Ellis. Commanding officer, Women's Transport Service, First Aid Nursing Yeo-

M. Ck. Allied Control Commission for Austria

Mark Wayne Clark. General, U.S.A. Commanding General, United States Forces in Austria.

- M. C. MI. Rhode Island (in part) Matthew C. Mitchell. Associate Professor of Political Science, Brown University, Provi-
- Law (in part) Mitchell Dawson. Lawyer, writer. Former Editor, Chicago Bar Record, Chicago, Ill.
- I. D. T. Military Academy, U.S. Maxwell D. Taylor. Major General, U.S.A. Superintendent, U.S. Military Academy, West Point, N.Y.
- M. E. H. Biochemistry Martin E. Hanke. Associate Professor of Biochemistry, The University of Chicago, Chicago, Ill. Co-author of Practical Methods in Biochemistry.
- Italian Literature Michele F. Cantarella. Associate Professor and Chairman, Department of Italian language and literature, Smith College, Northampton, Mass. Co-author of Dieci Novelle Contemporanee;
- Pneumonia Maxwell Finland, M.D. Associate Physician, Thorndike Memorial Laboratory; Physician in Chief, Fourth Medical Service, Boston City Hospital. Associate Professor of Medicine, Harvard Medical School, Boston, Mass.
- Medicine; etc. Morris Fishbein, M.D. Editor, The Journal of the American Medical Association and Hygota, Chicago, Ill. Editor of medical articles, Britannica Book of the Year.
- Bacteriology Martin Frobisher, Jr. Associate Professor of Bacteriology, The Johns Hopkin; School of Hygiene and Public Health, Baltimore, Md. Author of Fundamentals of Bacteriology; etc.
- Public Utilities (in part) Martin G. Glaeser. Professor of Economics, University of Wisconsin, Madison Wis.
- Budgets, National (in part); etc. Milton Gilbert. Chief, National Income Division, Bureau of Foreign and Domestic Commerce, Department of Commerce, Washington,
- Indiana (in part) Marguerite H. Anderson. Former Chief, Indiana Division, Indiana State Library, Indianapolis, Indiana.
- Mannel Hahn. Head, Service Section, The Rotarian and Revista Rotaria. Author of U.S. Post Office, 1851–60; U.S. Postal Markings, 1847– 51; So You're Collecting Stamps; etc.
- M. H. E. I. H. E. Wyoming (in part)
 Marie H. Erwin. Former State Historian,
 Wyoming State Historical Department, Cheyenne, Wyo. Author of Wyoming Historical Blue

- M. H. W. Oklahoma (in part) N. B. D. Muriel H. Wright. Associate Editor, The Chronicles of Oklahoma, Oklahoma Historical Society, Oklahoma City, Okla.
- British Women's Services, World War II (in part) Mary Joan Caroline Tyrwhitt. Director, Auxiliary Territorial Service, Eng.
- M. J. Hs. I. J. Hs. Anthropology (in part)
 Melville J. Herskovits. Professor of Anthropology, Northwestern University, Evanston, Ill.
- Words and Meanings, New (in part) Mamie Jane Meredith. Instructor in English, University of Nebraska, Lincoln, Neb. Assist-ant Editor, the *Bulletin*, American Business Writing Association.
- **1. J. P.** Displaced Persons Malcolm Jarvis Proudfoot. Professor of Geography, Northwestern University, Evanston, Ill. Author of The Outlying Business Centers of Chicago; etc.
- Massachusetts (in part) Maurice J. Tobin. Governor of Massachusetts.
- Hungary (in part) Count Michael Karolyi. Former President of the Hungarian Republic. Author of Fight Against the World.
- Liquors, Alcoholic (in part)
 Max Loeb. Chief of Field Division, Illinois Liquor Control Commission.
- Max McCullough. Commissioner, Office of Price Administration, Office of Temporary Controls, Washington, D.C.
- I. Mt. Pacific Islands, French; etc. Marius Moutet. Minister of Colonies, 1936–38; Minister of Overseas France, 1946–
- Track and Field Sports; etc. Milton P. Woodard. Sports writer, The Chicago N. Mm. Sun, Chicago, Ill.
- I. Rox. Philippines, Republic of The Manuel Acuña Roxas. President, Republic of M. Rox. the Philippines.
- Fair Employment Practice Malcolm Ross. Former Chairman, Fair Employment Practice Committee, Washington, D.C. Author of Machine Age in the Hills; etc.
- Mayling Soong Chiang (Madame Chiang Kaishek). Founded and directed National Chinese Women's Association for War Relief. Author of China in Peace and War; This is Our China; We Chinese Women; etc.
- M. S. Mr. Hutchins, Robert Maynard Milton S. Mayer. Lecturer, University College; Tutor, Social Thought, The University of Chicago, Chicago, Ill.
- I. Sp. Birth Statistics (in part); etc. Mortimer Spiegelman. Supervisor of Mathematical Research, Statistical Bureau, Metropolitan Life Insurance Company.
- Birth Control Margaret Sanger. Honorary Chairman, Planned Parenthood Federation, Inc.
- Young Womens Christian Association

Mary S. Sims. Secretary, General Administra-tion, National Board, Young Womens Chris-tian Associations of the United States of America.

- British West Africa Margaret Wrong. Author of Land and Life of Africa; Five Points for Africa; Across Africa; West African Journey.
- M. W. Js. South Australia Murray Willoughby James. Chief of Staff, The News, Adelaide, Australia; in London with Melbourne Herald Cable Service.

- National Parks and
- Monuments
 Newton B. Drury. Director, National Park
 Service, U.S. Department of the Interior,
 Washington, D.C.
- . C. B. Lumber (in part)
 Nelson C. Brown. Professor in charge of Forest N. C. B. Utilization, New York State College of Forestry, Syracuse University, Syracuse, N.Y.
- N. E. W. Plague, Bubonic and Pneumonic
 - N. E. Wayson, M.D. Medical Officer in charge, Plague Investigations, U.S. Public Health Service, San Francisco, Calif.
- N. F. S. Aviation, Military (in part) Nathaniel F. Silsbee. Colonel, Air Corps, A.U.S. Technical Editor, Skyways. Co-author of Jet Propulsion Progress.
- Canals and Inland Waterways (in part)

Nicholas George Gedye. Consulting Civil Engineer, Westminster, Eng.

- Naboth Hedin. President, American Swedish News Exchange Inc., New York, N.Y. Co-editor of Swedes in America.
- N. J. S. Central European and Balkan

Literature (in part) Nicholas Joseph Szenczi. Lecturer in Hungari-an Language and Literature, School of Slavonic and East European Studies, University of London, London, Eng.

- N. L. P. Astronomy Newton Lacy Pierce. Associate Professor of Astronomy, Princeton University, Princeton,
- N. M. Bz. National Mediation Board Nelson M. Bortz. Bureau of Labor Statistics, U.S. Department of Labor, Washington, D.C.
- Borneo, British Sir Neil Malcolm. President, British North Borneo Company. Author of Science of War; Bohemia 1866.
- Norman Thomas. Socialist presidential candidate, 1940, 1944. Author of America's Way
- I. W. Languages
 Neville Whymant. Editor in Chief, Chinese
 Ministry of Information. Author of Colloquial
 Chinese; Oceanic Theory of Japanese Origins; etc.
- Young Men's Christian Association
 - Owen E. Pence. Director, Bureau of Records, Studies and Trends, National Council of the Young Men's Christian Associations of the United States of America.
- North Dakota (in part) Orin Grant Libby. Professor of American History (retired), University of North Dakota, Grand Forks, N.D.
- Oscar J. Wile. President, Browne-Vintners
 Co., Inc., New York, N.Y. Author of Wine
 Without Frills; What, When and How to Serve.
- Securities and Exchange O. L. Ds. Commission (in part)
- Orval L. DuBois. Secretary, Securities and Exchange Commission, Philadelphia, Pa.
- Owen Lattimore. Director, Page School of International Relations, The Johns Hopkins University, Baltimore, Md. Author of Solution in Asia; etc.
- O. McK. International Organizations; P. H. M.

etc. Oliver McKee, Jr. Lieutenant Colonel, U.S.A. Special Assistant, Assistant Secretary of State, Washington, D.C.

- O. N. B. Veterans' Administration Omar N. Bradley. General, U.S.A. Administrator of Veterans' Affairs, Veterans' Administration, Washington, D.C.
- Allied Military Government O. P. Echols. Major General, U.S.A. Chief, Civil Affairs Division, War Department Spe-cial Staff, Washington, D.C.
- Automobile Industry Oscar Paul Pearson. Manager, Statistical Department, Automobile Manufacturers' Association, Detroit, Mich.
- Price Administration, Office of

Paul Aldermandt Porter. Former Administrator, Office of Price Administration, Washington, D.C.

- B. D. Drug Administration, U.S. Paul B. Dunbar. Commissioner of Food and Drugs, Food and Drug Administration, Federal Security Agency, Washington, D.C. P. B. D.
- B. F. Federal Works Agency Philip B. Fleming. Major General, U.S.A. Administrator, Federal Works Agency, Washington, D.C.
- P. Bn. . Bn. Crime (in part); etc. Preston Benson. Journalist for the Star, London, Eng. Author of Unknown Country.
- P. By. Ohio (in part); etc.
 Paul Bellamy. Editor, Cleveland Plain Dealer,
 Cleveland, Ohio.
- Pedro Correia Marques. Member of the Town Council of Lisbon, Portugal. Author of Vida de Santo António de Lisboa; etc.
- P. Cr. Ancient Monuments, British
 Philip Corder. Assistant Secretary, Society of
 Antiquaries of London, Eng. Vice-President
 of the Royal Archaeological Institute of Great Britain and Ireland.
- Heart and Heart Diseases Paul D. White, M.D. Clinical Professor of Medicine, Harvard University Medical School; Physician, Massachusetts General Hospital, Boston, Mass. Author of *Heart Disease*.
- P. Eg. Business Review (in part); etc. Paul Einzig. Political correspondent, Financial Times, London, Eng. London correspondent, Commercial and Financial Chronicle, New York, N.Y. Author of The Theory of Forward Exchange; Exchange Control; etc.
- Geography Preston Everett James. Professor of Geography, Syracuse University, Syracuse, N.Y. Author of An Outline of Geography; Latin America;
- Prisoners of War; etc. Philip E. Ryan. Director, International Activities, American National Red Cross.
- New Zealand Peter Fraser. Prime Minister and Minister of External Affairs of New Zealand.
- Committee for Economic Development

Paul G. Hoffman. Chairman, Board of Trustees, Committee for Economic Development. President, The Studebaker Corporation, South Bend, Ind.

War and Defense Agencies (in bart)

Patterson Hughes French. Assistant Division Chief, Division of Administrative Management, Bureau of the Budget, Executive Office of the President, Washington, D.C.

Machinery and Machine Tools (in part)

Sir Percy Herbert Mills. Managing Director, W. & T. Avery, Ltd., Soho Foundry, Birmingham, England.

- Oregon (in part) P. H. P. Philip H. Parrish. Editor of the editorial page, The Oregonian, Portland, Ore. Author of Before the Covered Wagon; Historic Oregon.
 - Amsterdam Pieter Jan Mijksenaar. Director of Public Relations, Municipality of Amsterdam, Netherlands. Author of Amsterdam, Its Beauty and Character; etc.
 - Bank for International Settlements

Per Jacobsson. Economic Advisor to the Bank for International Settlements, Basle, Switzerland. Author of Postwar Problems.

- British Women's Services, World War II (in part)
 Pauline Mary Gower. Director of Women
 Personnel, Air Transport Auxiliary. Author of Women with Wings.
- National Labor Relations Board

Paul M. Herzog. Chairman, National Labor Relations Board, Washington, D.C.

- Political Action Committee Philip Murray. President, Congress of Industrial Organizations.
- Insurance (in part) Percy Stebbings. Insurance editor and correspondent to Financial Times; Bankers' Magazine;
- T. Gynaecology and Obstetrics Paul Titus, M.D. Secretary-Treasurer, American Board of Obstetrics and Gynecology.
- Agricultural Research R. D. L. Administration

P. V. Cárdon. Research Administrator, Agricultural Research Administration, U.S. Department of Agriculture, Washington, D.C.

- International Trade (in part) Paul Wiers. Economist, Bureau of the Budget, Executive Office of the President, Washington, D.C. Former Assistant Chief, Trade Statistics Division, Office of International Trade, U.S. Department of Commerce, Washington, D.C.
- Conservative Party, Great Britain Richard Austen Butler. Member of Parlia- R. E. D. ment. Minister of Education, 1941-45.
- Northwest Territories R. A. Gibson. Deputy Commissioner, Administration of the Northwest Territories, Can.
- Ruth A. Gallaher. Associate Editor of the State Historical Society of Iowa, Iowa City, Iowa. Co-author of Stories of Iowa for Boys and
- a. L. Endocrinology (in part)
 Rachmiel Levine, M.D. Former Director of
 Metabolic and Endocrine Research, Michael
 Reese Hospital, Chicago, Ill.
- Reginald Arthur Ryves. Author of The King's Highway; The Channel Tunnel Project.
- A. Se. Gilbert Islands (in part)
 Raymond Ames Spruance. Admiral, U.S.N.
 President, U.S. Naval War College, Newport,
- R. A. Wr. Canals and Inland Waterways (in part); etc. Raymond A. Wheeler. Lieutenant General, U.S.A. Chief of Engineers, War Department, Washington, D.C.

 RAUTOF Freiheit.

 R. F. K.
- Leather Ralph B. Bryan. Editor, The Community News, Chicago, Ill. Author of Encyclopedia of the Shoe and Leather Industry.
- Switzerland (in part) René Bovard. Editor, Revue Suisse Contemporaine, Lausanne, Switzerland.

- Lynching R. Gg. Robert Burns Eleazer. Specialist in Race Relations, General Board of Education, The Methodist Church.
- R. B. J. Minnesota (in part)
 Roy B. Jewett. Director, Minnesota Postwar
 Council, St. Paul, Minn.
- R. B. Ml. Fires and Fire Losses (in part) Robert Baird Mitchell. Eastern editor, The National Underwriter, New York, N.Y.
- R. B. Mm. Great Britain and Northern B. Mm. Great Britain and Northern Ireland, United Kingdom of R. G. M. Paper and Pulp Industry
 Ronald Buchanan McCallum. Fellow of Pember College Oxford. Eng. University Lecture College Oxford. Eng. University Lecture R. G. MacDonald. Secretary-Treasurer, Technical Association of the Pulp and Paper broke College, Oxford, Eng. University Lecturer in Politics. Author of Public Opinion and The Last Peace; Great Britain and France 1939— University Lec
- Civil Liberties (in part) Roger W. Baldwin. Director, American Civil Liberties Union, New York, N.Y. Author of Liberty Under the Soviets; Civil Liberties in Indus-
- . B. S. American Citizens Abroad Ruth B. Shipley. Chief, Passport Division, Department of State, Washington, D.C.
- Ruth Cheney Streeter (Mrs. Thomas W. Streeter). Former Director, U.S. Marine Corps, Women's Reserve.
- Raul d'Eca. Acting Chief, Brazilian Section, American Republics Area Division, Office of International Information and Cultural Affairs, U.S. Department of State, Washington, D.C. Brazil (in part); etc. R. H. Sd.
- San Francisco Roger Dearborn Lapham. Mayor of the City and County of San Francisco, Calif.
- Tokyo (in part) Roosevelt Der Tatevasion. Director of Production, Personnel Narratives Division (F.L. D.), Office of Information Services, Head-quarters, Army Air Forces, New York, N.Y.
- R. E. Cleland. Professor of Botany, Head of Department of Botany and Bacteriology, Indiana University, Bloomington, Ind.
- Osteopathy (in part) R. E. Duffell. Director, Division of Public and Professional Welfare, American Osteopathic Association.
- R. E. E. H. . E. E. H. Baptist Church Reuben E. E. Harkness. President, The American Baptist Historical Society.
- Federal Trade Commission Robert E. Freer. Commissioner, Federal Trade Commission, Washington, D.C.
- . E. Lk. Commandos, British Robert Edward Laycock. Chief of Combined Operations, Great Britain.
- British Women's Services, World War II (in part) Lady Ruth Eldridge Welsh. Director, Women's Auxiliary Air Force, 1943-46, Eng.
- Central European and Balkan R. L. D. Literature (in part) Robert Faesi. Professor of German Literature, University of Zürich, Zürich, Switzerland. Author of Die Stadt der Väter; Die Stadt der
- Robert F. Kelley. Assistant Secretary, United
- British Women's Services, World War II (in part)

Stella, Dowager Marchioness of Reading, Eng. Chairman, Women's Voluntary Services. Governor, British Broadcasting corporation.

- . **Gg. Belgian Colonial Empire**Robert Godding. Leader, Belgian Liberal
 Party. Belgian Minister for the Colonies.
- Osteopathy (in part) Ray G. Hulburt, D.O. Former Editor, American Osteopathic Association.
- Oklahoma (in part) Roy Gittinger. Regents' Professor of History, University of Oklahoma, Norman, Oklahoma. Author of Formation of the State of Oklahoma, 1830 to 1906; etc.
- Industry, New York, N.Y.
- R. G. V. Submarine Warfare (in part) Richard George Voge. Rear Admiral, U.S.N. (retired). Co-author of The History of Submarine Commands During World War II; etc.
- Political Science, University of California, Los Angeles, Calif. Author of Cuba and the United States, 1900-1935; Outline of Latin American History.
- . Hs. Community Trusts Ralph Hayes. Executive Director, New York Community Trust. Director, Equitable Trust Company, Wilmington, Del. R. Hs.
- Rollin Harrison Sanford. Head crew coach, Department of Physical Education and Athletics, Cornell University, Ithaca, New York.
- California (in part) Robert Hale Shields. Former Assistant in History, University of California, Berkeley, Calif.
- . H. Ws. Formosa (in part); etc. Robert Henry Williams. Writer, Upton Close staff, Hollywood, Calif. Author of *The Enemy* R. H. Ws. is Here.
- Ri. M. F. Commission on a Just and Durable Peace

Richard M. Fagley. Co-Secretary, The Commission on a Just and Durable Peace of the Federal Council of the Churches of Christ in America.

- R. Is. Anaemia Raphael Isaacs, M.D. Director, Haematology Research Laboratory and Attending Physician in Haematology, Michael Reese Hospital, Chicago, III.
- . J. B. Archaeology (in part)
 Robert J. Braidwood. Assistant Professor of
 Old World Prehistory, The Oriental Institute
 and the Department of Anthropology. The
 University of Chicago, Chicago, Ill.
- Securities and Exchange Commission (in part) Robert Kendall McConnaughey. Commissioner, U.S. Securities and Exchange Commission.
- Fisheries (in part) R. L. Cn. Rachel L. Carson. Information Specialist Fish and Wildlife Service, U.S. Department of the Interior, Washington, D.C.
- Robert Lee Doughton. Member, U.S. House of Representatives; Chairman, Committee on Ways and Means, Washington, D.C.
- R. L. Forney. General Secretary, National Safety Council, Chicago, Ill.
- States Polo Association. Former sports writer, R. L. Fy.

 The New York Times, New York, N.Y.

 Ross Lee Finney. Professor of Music, Smith College, Northampton, Mass.
 - War Production (in part) Roger L. Putnam. Director, Office of Contract Settlement, Federal Reserve System, Washington, D.C.

- R. L. S-R. Radio (in part)
 Reginald Leslie Smith-Rose. Superintendent,
 Radio Division, National Physical Laboratory,
 Teddington, England.
- R. L. Ss. Investments Abroad, U.S. and British (in part)
 Robert L. Sammons. Acting Chief, International Economics Division, Office of Business Economics, U.S. Department of Commerce, Washington, D.C.
- R. Lt. Sculpture
 Robert Laurent. Instructor, Ogunquit School
 of Painting and Sculpture, Maine. Assistant
 Professor of Fine Arts, Indiana University,
 Bloomington, Ind.
- R. Man. Motion Pictures (in part)
 Roger Manvell. Research Officer, British Film
 Institute. Co-author of Twenty Tears of British
 Cinema.
- R. M. Ho. Black Markets (in part)
 Ronald Martin Howe. Assistant Commissioner, Criminal Investigation Department,
 New Scotland Yard, London, Eng.
 Sam
- R. M. Hs. Nursing, War (in part)
 Ruth Marian Hallowes. State registered nurse and part-time coach to the Royal College of Nursing, London, Eng.

 Sidney
- R. M. MacD.

 Raibeart Macintyre MacDougall. Indian
 Civil Service. Counsellor to the Governor of
 Burma.
- Ro. A. T. New Deal (in part)
 Robert Alphonso Taft. United States Senator from Ohio.
- R. P. Bo. Mathematics
 Ralph Philip Boas, Jr. Executive Editor of
 Mathematical Reviews.
- R. P. Br. Missouri (in part)
 Ralph P. Bieber. Professor of History, Washington University, St. Louis, Mo.

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 S. Gs.
 Stre.
- R. P. P. War Crimes (in part)
 Robert Porter Patterson. Secretary of War,
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- R. R. W. Coast Guard, U.S. (in part)
 Russell R. Waesche. Late Admiral, U.S.
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- R. S. Cr. Naval Academy, U.S.
 R. S. Craighill. Commander, U.S.N. Secretary, Academic Board, United States Naval Academy, Annapolis, Md.
- R. Se. Liquors, Alcoholic (in part)
 Ronald Sutcliffe. Senior principal officer,
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- R. S. G. Okinawa Roy Stanley Geiger. Late Lieutenant General, U.S. Marine Corps. Former Commanding General, Fleet Marine Force, Pacific.
- R. S. S. Spain; etc.
 Robert Sidney Smith. Associate Professor of
 Economics, Duke University, Durham, N.C.
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- R. S. T. Munitions of War; etc.
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- R. S. W. P. Civil Liberties (in part)
 Robert Spence Watson Pollard. Author of
 Conscience and Liberty; The New Education Act
 Explained.
- R. T. K. Photography (in part)
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 S. M. G. Sidonie Study A. Author
- R. Tu. Elections (in part); etc.
 Ray Tucker. Writer of syndicated column,
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 Mirrors of 1932; Sons of the Wild Jackass.

- R. V. A. M. Portuguese Literature Rodrigo Victor Albuquerque e Mello. Functionary of Secretariado Nacional da Informacão, Cultura Popular e Turismo. Author of Seiva; Rimas; etc.
- R. W. Cr. Radio (in part)
 Rufus William Crater. Associate Editor,
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- R. Wn. Australia, Commonwealth of Roland Wilson. Commonwealth Statistician and Economic Adviser to the Treasury, Canberra, Australia. Author of Capital Imports and the Terms of Trade.
- R. Zl. Palaeontology (in part)
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- Sa. S. Vatican City State
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- S. B. F. Germany; etc. Sidney B. Fay. Professor of History, Harvard University and Radeliffe College, Cambridge, Mass. Author of Origins of the World War; Rise of Brandenburg—Prussia to 1786.
- S. B. Wr. Copyright
 Sam B. Warner. Register of Copyrights,
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- S. By. Night Clubs
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- S. C. C. Salvador, El (in part)
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 Salvador.
- S. Gs. Eastern Churches
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- S. J. Bak.
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 States.
- S. J. Hy. Radiology Sydney James Hawley, M.D. In private practice of Radiology, Seattle, Wash.
- S. L. Pr. British-U.S. War Boards Stanley L. Phraner. Former U.S. Secretary, Combined Production and Resources Board, Washington, D.C.
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- S. McG. Texas (in part)
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- S. M. G. Children in World War II
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 World at War.
- S. M. Hy. Channel Islands Sybil Mary Hathaway. Dame de Serk. Author of *Maid of Sark*.

- S. M. N. Afghanistan
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 the Court of St. James, London, Eng.
- S. Rn. Pearl Harbor Inquiries (in part) Seth Richardson, Chief Counsel, Joint Congressional Committee investigating Pearl Harbor disaster, January 1946-July 1946.
- S. R. S.

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- S. Sp. Music (in part)
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- S. Tf. Radio (in part) Sol Taishoff. President, Editor and Publisher of Broadcasting Publications, Inc., Washington, D.C.
- St. W. New York City
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- T. Bar. Wealth and Income,
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- T. C. B. Minnesota (in part)
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- T. C. Pe. Illinois (in part)
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- T. Gz. Bolivia (in part)
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- T. H. O. Physics
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- T. H. We. Sinkiang
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- T. J. D. Automobile Racing; etc. Thomas J. Deegan, Jr. Vice-President, Abbott Kimball Company, New York, N.Y. Author of This Is Public Relations.
- T. L. United Nations
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- T. N. World War II (in part); etc. Thomas North. Brigadier General, U.S.A. Chief, Current Group, Plans and Operations Division, General Staff, War Department, Washington, D.C.

- Costa Rica (in part) T. P. Mi. Teodoro Picado Michalski. President of Costa Rica. Author of La Escuela y la Democracia Costarricense; etc.
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- T. Td. Angling
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- Theodore T. Stone, M.D. Associate Professor in Nervous and Mental Diseases, Northwestern University Medical School, Chicago, Ill.
- Four Freedoms Thomas Verner Smith. Professor of Philosophy, The University of Chicago, Chicago, Ill. Author of The Democracy Way of Life; Discipline for Democracy.
- Immigration and Emigration, U.S.; etc. Ugo Carusi. Commissioner, Immigration and Naturalization Service, U.S. Department of Justice, Philadelphia, Pa.
- T. Ce. Caroline Islands (in part); etc. Upton Close. Author of Revolt of Asia; Behnd the Face of Japan; Outline History of China; etc.
- 7. Bu. Science, Future Techniques of Vannevar Bush. President, Carnegie Institu-tion of Washington, Washington, D.C. Direc-tor, Office of Scientific Research and Development. Author of Science—The Endless Frontier;

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- V. J. E. Logistics of World War II Vincent J. Esposito. Brigadier General, U.S.A. Chief, Logistics Group, Operations Division, War Department General Staff, Washington, D.C.
- V. L. Ck. Vernon Lawson Clark. National Director, U.S. Savings Bonds Division, Treasury Department, Washington, D.C.
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- Warren A. Dow. Secretary, Amateur Fencers League of America.
- W. A. Or. Liberalism William Aylott Orton. Professor of Economics. Smith College, Northampton, Mass. Author of Twenty Years Armistice; The Liberal Tradition.
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- 7. B. Be. Women's Army Corps Westray Battle Boyce. Colonel, G.S.C. Former Director, Women's Army Corps.
- W. B. L. Aliens (in part) William Blair Lyon. Principal, Great Britain Home Office.
- W. B. Mi. Federal Security Agency Watson B. Miller. Administrator, Federal Security Agency, Washington, D.C.

- W.B.N. William Bunnell Norton. Professor of History, Boston University, Boston, Mass.
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- **Botanical Gardens** William Crocker. Director, Boyce Thompson Institute for Plant Research, Inc., Yonkers,
- Christian Science William D. Kilpatrick. Manager, Committees on Publication, The First Church of Christ, Scientist, Boston, Mass.
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- 7. D. Mn. Photography (in part)
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- W. D. R. Golf William D. Richardson. Golf Editor, The New York Times, New York, N.Y.
- V. E. Ee. New Jersey (in part)
 Walter E. Edge. Governor of New Jersey.
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- Literature (in part)
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 Togistics of World War II

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 Journauxis.

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W. F. de B. Netherlands Colonial

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 - V. Ft. Paraguay; etc.
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W. J. Cl. Co-operative Movement

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Chambers of Commerce (in part)

William K. Jackson. President, Chamber of Commerce of the United States, Washington,

- V. L. Be. Eye, Diseases of William L. Benedict, M.D. The Mayo Clinic, W. L. Be. Rochester, Minn. Professor of Ophthalmology, University of Minnesota Graduate School, Mayo Foundation, Rochester, Minn.
- International Trade (in part) William L. Clayton. Under Secretary of State for Economic Affairs, U.S. Department of State, Washington, D.C.
- Motion Pictures (in part) William Lewin. Chairman, Committee on Motion Pictures, Department of Secondary Teachers, National Education Association.
- Public Utilities (in part) Wilfrid L. Randell. Consulting editor. Author of Michael Faraday; S. Z. de Ferranti; etc.
- Intoxication, Alcoholic W. L. Treadway, M.D. Medical Director, U.S. Public Health Service (retired), Santa Barbara, Calif.
- Wheeler McMillen. Editor in Chief, Farm Journal and Farmer's Wife.
- 7. M. K. Anthropology (in part) Wilton Marion Krogman. Associate Professor of Physical Anthropology and Anatomy, The University of Chicago, Chicago, Ill. Author of Physical Anthropology of the Seminole Indians of Oklahoma; Growth of Man.

W. M. S. G. K. Territorial Army, British

Sir Walter Mervyn St. George Kirke. Director-General, Territorial Army, 1936–39; Inspector-General, Home Defences, 1939; Commander-in-Chief, Home Forces, 1939-40. Author of On Hazardous Service.

- W. M. W. World War II (in part)
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 N.R. (Inactive). Director and Librarian,
 Boston Athenæum, Boston, Mass. Editor, The
 American Neptune: A Quarterly Journal of Maritime History; etc.
- W. M. W. S. Interstate Commerce Commission

Walter M. W. Splawn. Commissioner, Interstate Commerce Commission, Washington, D.C. Author of Consolidation of Railroads; Government Ownership and Operation of Railroads.

- W. Pe. Gilbert Islands (in part); etc. Willard Price. Author of Key to Japan; Japan and the Son of Heaven; Japan's Islands of Mystery; etc.
- W. Pg. Pensions, War (British and European) (in part)
 Wilfred Paling. Member of Parliament, Minister of Pensions, Great Britain.

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- W. P. S.

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 Staff of Newark Evening
- W. S. G.

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 W. W. Sh.
- W. T. M. Protestant Episcopal Church William T. Manning. Retired Protestant Episcopal Bishop of New York.

- W. V. W. Motion Pictures (in part)
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 Willard W. Beatty. Director of Education,
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- W. W. L. War Production (in part)
 William W. Lockwood. Assistant Director,
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- W. W. Sh. Shipping, Merchant Marine (in part)
 W. W. Smith. Chairman, United States Maritime Commission, Washington, D.C.
- X. Anonymous.

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EVENTFUL YEARS

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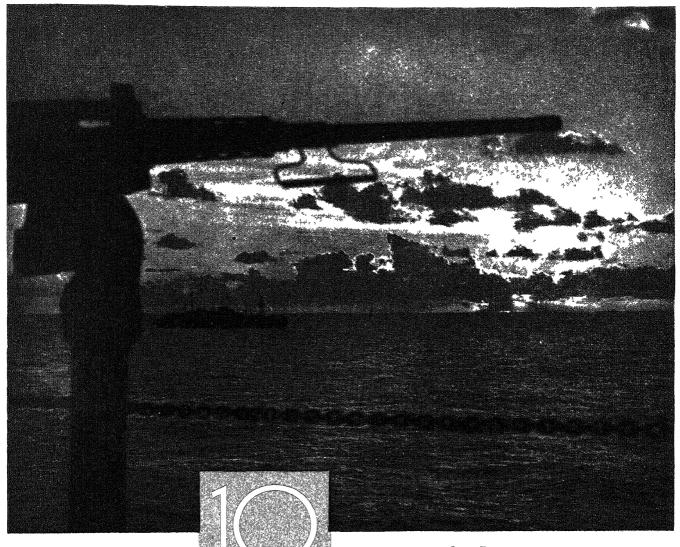
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Abbreviations

Had Rip Van Winkle returned to the U.S. scene during the years 1937–46, he would have needed at his elbow a key to current abbreviations in reading reports of government activities in his daily newspaper. Without such a key, he would have been unable either to identify the players or follow the score. For the use of abbreviations to denote government and other organizations greatly increased during the decade, a period which saw an enormous expansion in the apparatus of government.

Because of the limited space available to them, headline writers faced a difficult problem in dealing with the many new agencies created by the Roosevelt administration to carry out the New Deal program. The problem was conveniently solved by the employment of alphabetical abbreviations, both in the headlines and in the text of news dispatches. Possessing the cardinal virtue of brevity, many of these verbal shortcuts became part of the everyday speech of the period.

The use of abbreviations, of course, was by no means new. The letters G.O.P. and G.A.R., for example, had been familiar to newspaper readers for many years. Equally familiar were the letters FBI, long used for the Federal Bureau of Investigation. To these and other old timers were

Eventful Years

added a legion of other abbreviations. The list, indeed, had become so long that a study of these abbreviations necessarily held high priority on the agenda of new residents in the national capital.

Some of the abbreviations used for the new agencies, such as OPA, OSS, and U.S.O., came trippingly to the tongue. Others, composed of a less euphonious combination of letters, such as ODHWS, though convenient enough for the headline writer, had little appeal either to the eye or the ear. Fortunate, therefore, the agency born with a name whose alphabetical abbreviation had the swing and catch of a slogan!

Though four-, five- or even six-letter combinations were represented on the list, three-letter words comprised the bulk of the abbreviations for federal agencies used during the decade. NIRA—National Industrial Recovery administration—soon became NRA, far more effective as a recovery slogan than its four letter predecessor.

In several instances the same symbols were used for two separate agencies, for example, CCC—Civilian Conservation corps and Commodity Credit corporation. Occasionally, too, letters were appropriated for a federal unit previously employed as an abbreviation for a private or-

ganization or association. In short, there were few if any ground rules in the game of abbreviation making.

A.W.O.L., K.P., and other abbreviations continued to hold a place of respectable antiquity in the army's vocabulary. World War I made the public familiar with many abbreviations, among them A.E.F., S.O.S. (services of supply) and G.H.Q. World War II, which lasted longer and required an even more complete mobilization of manpower and resources, gave a correspondingly wider field for verbal shortcuts. It was this war that saw popular acceptance of G.I., government issue, as the abbreviation for the U.S. soldier, counterpart of the older British Tommy Atkins, the French poilu and the U.S. doughboy of 1917-18.

Students of World War II manuals found it necessary to acquaint themselves with hundreds of abbreviations officially authorized for technical military terms. To the layman, most of these were of little importance. Some military abbreviations, however, such as AAF, E.T.O., USFET and S.H.A.E.F. made almost daily appearances in the press.1

The army and navy both used abbreviations for their top commands. General Dwight D. Eisenhower was officially known as S.C.A.E.F.—supreme commander Allied expeditionary force.

The corresponding designation for General Douglas A. MacArthur was S.C.A.P.-supreme commander for the Allied powers.

In the navy, COMINCH denoted commander in chief, U.S. fleet, while CINCPAC and CINCLANT represented respectively the commanders in chief of the Pacific and

Among the women's services, abbreviations were widely used. In this group were the WAC, WAVES, WAFS and WASP. The American Women's Voluntary services, an organization of civilian women war workers, was better known by its abbreviation AWVS.

With increased power and improved status, organized labour played a big part in the history of the decade. As seen from the press headlines, abbreviations provided the key to the labour battles of these years. As new labour organizations achieved the spotlight, the alphabet was drafted to provide the appropriate letter symbol.

Since they contributed to the news of the decade, the headline writer also used abbreviations for many national business, professional and educational associations. Here, too, as in the government and labour fields, the advantages of brevity and the economy of words apparently tipped the scales against the disadvantages of occasional confusion and the uncertainty, among some readers, as to the exact organization which a particular group of letters represented.

With public interest increasingly turned to the work of international organizations, the close of the decade brought the alphabet under a new requisition. The letters U.N.O. hit the headlines soon after the formation of the United Nations organization (the "O" and the "organization" subsequently were dropped officially), and the letters U.N.E.S.C.O., denoting the United Nations Educational, Scientific and Cultural organization, became equally familiar to newspaper readers. When news of the operations of the United Nations Relief and Rehabilitation administration came over the wires, the letters U.N.R.R.A. saved many a headache on news desks.

Like the snows of yesteryear, abbreviations once used for agencies later abolished were almost forgotten, except for former employees or historians delving into the archives of the past. Creation of new agencies, and the catapulting of other organizations into the limelight, however, more than compensated for the retirement of NRA, WPB and others.

Despite the drafts already made upon it, however, the alphabet, with its 26 letters, showed no apparent signs of exhaustion, and stood ready to provide newcomers with their appropriate and individual, if not copyrighted, symbols. As the decade ended, there were no indications in Washington that 1946 was destined to mark the end of the era of abbreviations.

Among the abbreviations commonly used during the decade for government agencies and other organizations were the following:

AAA Agricultural Adjustment administration

AAF Army air forces
A.B.C. Audit Bureau of Circulations

ABSIE American Broadcasting Station in Europe

A.C.W.A. Amalgamated Clothing Workers of America A.D.A. Alley Dwelling authority

AFCC Air force combat command AFFC Air force ferrying command

A.F.G.E. American Federation of Government Employees

A.F.L. or A. F. of L. American Federation of Labor

A.F.M. American Federation of Musicians

A.F.R.A. American Federation of Radio Artists

AGF Army Ground Forces

A.I.B. American Institute of Banking A.I.F. Australian imperial force

A.L. American legion A.L.P. American Labor party

A.M.G. Allied military government A.M.G.O.T. Allied Military Government of Occupied Territory

AMVETS American Veterans of World War II

ANC Army nurse corps

A.N.G. American Newspaper guild

ANMB Army and Navy Munitions board

A.N.P.A. American Newspaper Publishers association ANZAC Australian and New Zealand Army corps

A.P. Associated Press

ARC American Red Cross

ASCAP American Society of Composers, Authors and Publishers

A.S.N.E. American Society of Newspaper Editors

A.S.P.C.A. American Sociéty for the Prevention of Cruelty to

ASTP Army Special Training program

ATC Air transport command (army) A.T.S. Auxiliary Territorial Service (A.U.S. Army of the United States (British)

AVC American Veterans' committee

AWVS American Women's Voluntary Services

B.B.C. British Broadcasting corporation B.E.F. British expeditionary force

B.E.S. Bureau of Employment Security BEW Board of Economic Warfare

BFDC Bureau of Foreign and Domestic Commerce

B.L.E. Brotherhood of Locomotive Engineers

B.L.S. Bureau of Labour Statistics

B.O.A.E. Bureau of Agricultural Economics B.R.T. Brotherhood of Railroad Trainmen

B.W.C. Board of War Communications

CAA Civil Aeronautics administration

CAB Civil Aeronautics board

C.A.P. Civil Air patrol

C.A.R.E. Cooperative for American Remittances to Europe CCC Civilian Conservation Corps; Commodity Credit Corp.

CEA Commodity Exchange administration

C.E.D. Committee for Economic Development

C.E.F. Canadian Expeditionary Force

C.I.O. Congress of Industrial organizations

COGSIS Committee of Government Statistics and Information service

Com Z Communications Zone (military)

CPA Civilian Production administration CSB Central Statistical board

CWA Civil Works administration

CWAC Canadian Women's Army corps

¹No universally accepted rule as to the use of periods in abbreviations was followed. One common method, and the one used in these volumes, was to use periods after the initials of all organizations except U.S. government agencies and some, but not all, organizations whose letters formed pronounceable words such as WAVES, etc. Newspapers and periodicals generally omitted periods in all cases, with space limitations, no doubt, in mind.—Ed.

9

C.W.S. Chemical warfare service D.A.R. Daughters of the American Revolution D.A.V. Disabled American Veterans DHC Defense Homes corporation D.L.B. Deposit Liquidation board DLC Disaster Loan corporation DP's Displaced Persons DSC Defense Supplies corporation
ECC Employees Compensation Commission
EDB Economic Defense board E.F.C. Emergency Fleet corporation EHFA Electric Home and Farm Authority E.I.B. Export-Import bank
ERA Emergency Relief administration
ESB Economic Stabilization board E.T.O. European Theatre of Operations
FAA Federal Alcohol Administration
F.A.O. Food and Agriculture organization (United Nations)
F.B.H. Federal Board of Hospitalization FCA Farm Credit Administration F.C.A.T. Federal Committee on Apprentice Training FCC Federal Communications commission FCIC Federal Communications commission
FCIC Federal Crop Insurance corporation
F.C.T. Federal Co-ordinator of Transportation
FDIC Federal Deposit Insurance corporation
FEA Foreign Economic Administration
FEPC Fair Employment Practices committee
F.E.R.A. Federal Emergency Relief administration F.F.I. French Forces of the Interior FHA Federal Housing administration FLA Federal Loan agency F.M.C. Farm Mortgage corporation FPC Federal Power commission FPHA Federal Public Housing Authority FSA Federal Security agency; Farm Security administration FSCC Federal Surplus Commodities corporation FTC Federal Trade commission FWA Federal Works agency GAO General accounting office GFA Grain Futures administration GPO Government Printing office GSC General Staff corps HOLC Home Owners Loan corporation IADB Inter-American Defense board ICC Interstate Commerce commission
I.L.G.W.U. International Ladies' Garment Workers' union
I.L.O. International Labor organization (or Office) I.L.U. International Longshoremen's union I.N.S. International News service
I.T.U. International Typographical union
I.U.M.S.W.A. Industrial Union of Marine and Shipbuilding
Workers of America I.W.W. Industrial Workers of the World M.O.I. Ministry of Information (British) M.O.W.W. Military Order of the World Wars MRC Metals Reserve company M.S.I.U.S. Military Service Institution of the United States N.A.A.C.P. National Association for the Advancement of Colored People N.A.A.F.I. Naval, Army and Air Force institutes (British) N.A.B. National Association of Broadcasters N.A.C.L. National Association of Letter Carriers N.A.M. National Association of Manufacturers N.A.N.A. North American Newspaper Alliance N.B.S. National Bureau of Standards
N.C.P.P.C. National Capital Park and Planning commission
N.C.W.C. National Catholic Welfare conference
N.E.A. Newspaper Enterprise association; National Educational association N.F.B.P.W.C. National Federation of Business and Professional Women's Clubs N.F.F.E. National Federation of Federal Employees N.F.S. National Fire service (British) NHA National Housing agency N.I.C.B. National Industrial Conference board NLRB National Labor Relations board N.M.U. National Maritime union
N.P.P.C. National Power Policy committee
NRA National Recovery administration
N.R.D.G.A. National Retail Dry Goods association
N.R.P.B. National Resources Planning board NYA National Youth administration
OAPC Office of Alien Property Custodian
OCD Office of Civilian Defense
OCI Office of the Coordinator of Information

OCR Office of Civilian Requirements OCS Office of Civilian Requirements
OCS Office of Civilian Supply; Officer candidate school
ODB Office of Dependency Benefits
ODHWS Office of Defense Health and Welfare services
ODT Office of Defense Transportation
OEM Office for Emergency Management
OES Office of Economic Stabilization
OEW Office of Economic Welfare
OFF Office of Facts and Figures OFF Office of Facts and Figures
OFRRO Office of Foreign Relief and Rehabilitation Opera-O.M.G.U.S. Office of Military Government, U.S. (Germany) OPA Office of Price Administration OSRD Office of Scientific Research and Development OSKI Office of Strategic Services
OSS Office of Strategic Services
OWI Office of War Information
OWMR Office of War Mobilization and Reconversion P.A.B. Petroleum Administrative board P.A.C. Political Action committee PAIS Public Affairs Information service P.B.A. Public Buildings administration P.E.A. Progressive Education association P.E.C. President's Emergency council P.E.C. President's Emergency council
P.H.S. Public Health service
P.I.C.A.O. Provisional Internat'l Civil Aviation organization
POE Port of Embarkation
PWA Public Works administration
R.A.F. Royal air force
R.C.A.F. Royal Canadian air force REA Rural Electrification administration RFC Reconstruction Finance corporation R.R.A. Rural Resettlement administration RRB Railroad Retirement board RRB Railroad Retirement board
S.A.B. Science Advisory board
S.C.M.W.A. State, County and Municipal Workers of America
SEC Securities and Exchange Commission
SFA Solid Fuels administration
S.H.A.E.F. Supreme Headquarters Allied Expeditionary Force
SPAB Supply Priorities and Allocations board
S.P.C.C. Society for Prevention of Cruelty to Children
SSB Social Security board
S.W.N.C.C. State, War, Navy Co-ordinating Committee (for occupied areas)
S.W.O.C. Steel Workers Organizing committee occupied areas)
S.W.O.C. Steel Workers Organizing committee
S.W.P.C. Smaller War Plants corporation
T.N.E.C. Temporary National Economic committee
TVA Tennessee Valley authority
T.W.O.C. Textile Workers Organizing committee
T.W.U. Transport Workers' Union (British)
T.W.U.A. Textile Workers union of America
LA W. United Automobile Workers U.A.W. United Automobile Workers
U.C.V. United Confederate Veterans
U.D.C. United Daughters of the Confederacy
U.M.W. United Mine Workers U.N. United Nations
U.N.E.S.C.O. United Nations Educational, Scientific and Cultural organization U.N.R.R.A. United Nations Relief and Rehabilitation administration U.O.P.W.A. United Office and Professional Workers of America U.P. United Press U.P.W.A. United Public Workers of America U.S.E.S. United States Employment service U.S.F.E.T. United States Forces European Theatre USIS United States Information service
U.S.O. United Service Organizations
U.S.S.R. Union of Socialist Soviet Republics
U.S.W.A. United Steel Workers of America U.S.W.V. United Spanish War Veterans U.T.W.A. United Textile Workers of America VA Veterans' administration VA Veterans' administration
V.F.W. Veterans of Foreign Wars
WAA War Assets administration
W.A.A.F. Women's Auxiliary Air Forces (British)
WAC Women's Army corps
WAFS Women's Auxiliary Ferry Squadron
WASP Women's Air Force Service Pilot WAVES Women Appointed for Volunteer Emergency Service WFA War Food administration W.F.T.U. World Federation of Trade Unions WLB War Labor board
WMC War Manpower commission
WPA Work Projects administration

WPB War Production board
WRA War Relocation authority
W.R.N.S. ("Wrens") Women's Royal Naval Service
WSA War Shipping administration
WSB Wage Stabilization board
Z.O.A. Zionist Organization of America
(See alro Words and Meanings, New.)
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Abdullah, Ibn Hussein

King Abdullah of Trans-Jordan (1882—), was born in Mecca, second son of the Sherif Hussein of Mecca (who became King Hussein of the Hejaz) and brother of King Feisal II. In 1921, when Winston Churchill, then colonial minister, set up at the Cairo conference the states of Iraq, Saudi Arabia and Trans-Jordan, Abdullah was made emir of Trans-Jordan, carved out of the hinterland of Palestine and Syria. After assuming the emirate, Abdullah concluded a treaty with Britain (1928) and established a constitution. Trans-Jordan's Arab Legion relieved British troops of frontier duties in Palestine during World War II and fought as part of the British expeditionary force during the Iraqi revolt (1941).

Toward the close of World War II, Abdullah announced his opposition to continuation of the mandate system, declaring it destroyed the sense of unity the Arabs had when they were "one people." He added that creation of a Jewish homeland in Palestine caused Arab "disunity."

On March 22, 1946, Britain ended its mandate over Trans-Jordan, giving that state full independence, and signed a treaty with that country which conferred on Britain the right to maintain garrisons on Trans-Jordan's soil. The treaty, however, was not signed by the respective governments but by King George and the emir, who was personally obligated to provide lines of communication through his country. On May 25, 1946, Abdullah exchanged his emirate for a kingdom and was formally proclaimed king of Trans-Jordan in impressive ceremonies at his capital.

Reports from Amman late in 1946 said Abdullah hoped to make Trans-Jordan the nucleus of a "Greater Syria," to include parts of Iraq, Syria and Palestine. This would make Abdullah ruler of a vast Arab territory and place him on equal terms with Ibn Sa'ud of Saudi Arabia and Farouk of Egypt.

Abe, Nobuyuki

Abe (1875-), Japanese army officer and statesman,

was born in Nov. 1875 at Ishikawa. A graduate of the Japanese Military Officer's school (1897), he held a number of high military posts. In his rise in the army hierarchy, he became successively vice-minister for the army, acting minister of the army and, in 1932, commander of the Taiwan (Formosa) army. Abe assumed the premiership at a moment of political confusion in Japan caused by the nazi-soviet pact. In Aug. 1939, while Baron Kiichiro Hiranuma was premier, this event, the consequences of which were inaccurately assessed by Japanese politicians, gave rise to great alarm in Tokyo. It was felt that Adolf Hitler had "double-crossed" his Japanese allies by conclusion of the pact with Joseph Stalin. As a result, Hiranuma resigned five days after the pact was signed and Abe became premier. Abe's tenure was undistinguished by any notable acts of statesmanship, although the first action of his cabinet was a statement that Japan did not intend to "become involved in the European war." He resigned Jan. 14, 1940, and was succeeded as prime minister by Admiral Mitsumasa Yonai. Abe, who was appointed governorgeneral of Korea in 1944, was ousted from that office in Sept. 1945 by Lt. Gen. John R. Hodge of the U.S. occupation forces. Later that month, Gen. Douglas MacArthur ordered Abe's arrest.

Aberhart, William

Aberhart (1878–1943), Canadian politician, was born on Dec. 30, 1878, near Kippen, Ont. Educated at Hamilton Normal school and Queen's university, he settled in Calgary, where he organized a Bible class that later expanded into the Calgary Prophetic institute. He became widely known for his religious broadcasts on behalf of the institute. In 1935, he became premier of Alberta as head of the Social Credit party, which promised monthly dividends of \$25 for every citizen; in the elections that year his party won 56 of the 63 seats in the Alberta legislature. Aberhart's program was based on the theories of social credit propounded in London by Major C. H. Douglas. Later, provincial and dominion courts and the privy council ruled his legislation unconstitutional, and in 1938 he set up a modified form of social credit. Aberhart, who was re-elected in 1940, died in Vancouver, B.C., May 23, 1943.

Abrasives

The salient data on the production of abrasives in the United States during years 1937-45 inclusive are presented in Table I.

In general, the need for abrasives was considerably aug-

Table I.—United States Production of Abrasives (In short tons, or as indicated) 1937 1938 1939 1940 1941 1942 1943 1944 1945 Aluminous Abrasives 2,029 765 2,131 2,989 5,765 4.876 1,046 Carbon Abrasives Industrial diamonds,* carats 1,885,970 1,397,398 3,570,111 3,809,856 6,882,248 11,207,003 12,175,430 12,656,835 10,793,285 Si ica Abrasives 18,611 502,328 237,167 22,188 13,012 31,855 856,309 342,218 30,212 34,959 668,027 310,512 41,685 1,001,814 487,665 29,301 99,445 837,662 541,350 82,379 897,983 558,606 65,878 806,878 1,067,178 328,156 Sand and sandstone (ground) 527,886 17,536 533,656 34,936 33,474 14,912 Si'ica Stone Abrasives 4,653 \$3,743 1,553 7,917 \$11,084 2,517 8,790 \$6,558 4,533 13,573 \$15,579 1,963 3,411 13,561 12,763 \$10,391 1,918 2,576 10,732 \$9,240 1,891 2,585 10,033 \$8,305 2,924 2.063 1.982 15,487 9,924 Silicate Abrasives 4,716 82,407 5,501 117,310 4,357 126,522 6,306 157,001 88,757 Artificial Abrasives Silicon carbide † . . . Aluminum oxide † . . . 30.365 25,346 24,206 86,401 28,031 53,220 25,771 42,015 50.016 86,309 *Imports; no domestic production. fincludes Canadian production

mented during World War II, with cases of output doubled and redoubled. However, in a few cases, the product was not particularly involved in war production, and with civilian supplies generally suppressed in favour of those needed for the war program, the product in question showed little or no increase, or even a decrease in output. For example, the output of garnet during the war years averaged little above that for 1937, most of the amount needed for the war program being supplied by decreasing ordinary industrial uses. The output of tripoli dropped more than half; the increase in abrasive uses was more than offset by decreases in other types of uses.

The most outstanding increase in demand for abrasives for the war program was that of industrial diamonds. Imports into the United States had been increasing heavily after 1929, as industry developed new uses, but where prewar increases had been measured in thousands of carats, war increases were in the millions. For a more detailed discussion, see Diamonds.

The United States was not able to supply its full demand for abrasives from domestic sources, and had to rely on imports for a portion of the total. Domestic supply was completely lacking only for industrial diamonds and corundum, and these two comprised the major portion of the imports. The imports of other types of abrasives were relatively small as compared with the domestic output. A comparison of domestic output, total imports and imports other than industrial diamonds or corundum is shown in Table II.

Table II.—Comparison of U.S. Output and Imports and Exports of Abrasives
(Thousands of dollars)

		Output		impor	rts		Exports		
			Total	Diamonds	Corundum	Others			
1937		\$12,259	\$7,418	\$6,542	\$135	\$741	\$1,160		
1938		8.959	4.727	4,213	139	375	1.075		
1939		10,318	10,247	9,727	105	415	1,416		
1940		13.995	11.51 <i>7</i>	11,02 <i>7</i>	165	325	1,606		
1941		22,089	15,470	14,909	287	274	3,220		
1942		30.018	22.602	21,785	261	556	6,684		
1943		35,830	22,565	21,738	332	495	3,511		
1944		34,403	23.534	22,658	437	439	2,092		
1945		31,695	13,493	12,757	457	279	2,088		

On the average, total imports ran about two-thirds of production, but most of the total consisted of the two products entirely imported—industrial diamonds and corundum—and after deducting these, the imports competing with domestic output were relatively small.

Exports of abrasive materials from the United States remained largely confined to manufactured materials, a large percentage of the value of which was manufacturing cost, so that the exports listed in Table II represented only a small portion of the raw materials value in the output column.

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Abyssinia

See ETHIOPIA.

Academy of Arts and Letters, American See Societies and Associations.

Academy of Arts and Sciences, American See Societies and Associations.

Academy of Political and Social Science, American

See Societies and Associations.

Accident and Health Insurance

See Insurance.

Accidents

Accidental deaths in the United States for the ten years from 1937 through the first eight months of 1946 totalled 943,090. Of these, 305,242 were motor vehicle deaths (see below); 157,500 were classified as public (as distinguished from motor vehicle deaths); 308,500 accidental deaths occurred in homes; 165,200 were occupational deaths and 41,200 were accidental deaths sustained in the United States by military personnel.

Peak year of accidental deaths during the ten-year period was 1937, when there were 106,000 fatalities. This total had been exceeded only once before; in 1936 accidental deaths reached a record of 110,052. Variation of other years were as follows:

193893,8	805
193992,6	i23
194096,8	885
1941101,5	113
194295,8	889
194399,0	13 8
1944	37
194596,0	000
1946	oo (First eight months)

There were two main trends of accidental deaths during the ten years: upward for motor vehicle fatalities; downward for all other types. In 1906, the first year for which information was available, there were only about 400 motor vehicle deaths—or a death rate of less than 1 per 100,000 population. Nonmotor vehicle deaths numbered about 79,600, a rate of 93. With a tremendous increase in travel, motor vehicle deaths rose, reaching a death rate of 30 in 1941. In that year the rate for nonmotor vehicle deaths was 46—half the 1906 rate.

In 1945, there were approximately 10,250,000 nonfatal disabling accidental injuries, in addition to the 96,000 deaths. All of these cases resulted in loss of time from usual activities beyond the day of the injury. "First-aid" injuries were not included.

For that year, wage loss, medical expense and overhead costs of insurance amounted to \$2,700,000,000. Property damage in motor vehicle accidents and fires cost \$1,100,000,000. So called "indirect" costs of occupational accidents amounted to \$1,300,000,000. These costs totalled \$5,100,000,000.

In 1937, occupational deaths reached 19,000. The following year they dropped to 16,000, went down to 15,500 in 1939, then advanced to 17,000 in 1940, to 18,000 in 1941 and to 18,500 in 1943. There was another drop in 1944 to 16,000, and that total was reached again in 1945. The trend for the first eight months of 1946 was slightly up.

In view of the rapid and enormous industrial expansion during the years 1937 through 1946, the fact that the occupational death rate did not soar to higher totals must be attributed to the intensified accident prevention work of all who had a part in the increasing production. There was a tremendous influx into industry of new workers: women, young people who had never worked before, office workers and older workers who had been out of industry for varying lengths of time.

During the war period, great emphasis was placed on integrating safety into training programs. Courses in industrial safety were sponsored by the federal government and worked out in conjunction with schools, the National Safety council and other organizations. These courses were held in every major city of the United States and were attended by thousands of men and women. Usually lim-

ited to 96 class hours, graduates took their training into various industrial jobs. Many of them became full time safety workers; others, who held production jobs, incorporated the safe practices they had learned into their regular jobs.

There was great emphasis on safety in ordnance plants, shipyards and aircraft manufacturing plants. Many of these war industries-usually considered highly hazardoushad enviable safety records.

The National Safety congress, held annually under the sponsorship of the National Safety council, continued to provide an opportunity for exchange of information in all fields of safety. Cancelled in 1945 because of travel restrictions, the congress was held in Chicago in 1946, and again attracted some 10,000 safety leaders from all parts of the United States and from numerous foreign countries.

Realizing that when peacetime activities were resumed, the United States would be confronted with the greatest accident problem in its history, safety leaders began well before the end of the war to prepare for postwar years. Spearheading the postwar highway safety program, Pres. Harry S. Truman called a Highway Safety conference in May 1946 to seek ways of mobilizing every available source of educational, engineering and enforcement skill to combat the traffic accident problem. At this conference, which was attended by some 2,000 safety leaders from state, county and city governments, federal departments and national organizations, a comprehensive program was approved. The program developed served as a guide for highway safety programs of officials and supporting nonofficial organizations throughout the United States.

There was a widening of interest in the National Traffic Safety contests sponsored by the National Safety council. These contests provided annual awards for states and cities having the best scores, taking account both of low acci-

Table I .- Principal Classes of U.S. Accidental Deaths,

Year				Total*	Motor vehicle	Public nonmotor vehicle	Home	Occupa- tional	Military personnel
1937				105,205	39,643	18,000	32.000	19,000	ŧ
1938				93,805	32,582	17,000	31.000	16,000	÷
1939				92,623	32,386	16,000	31,000	15,500	400 '
1940				96,885	34,501	16,500	31,500	17,000	700
1941			٠	101,513	39,969	15,5001	30,000 t	18,000 t	1,800
1942				95,889	28,309	16,000 ‡	30.500±	18.500 ±	6,800
1943				99,038	23,823	16,5001	33,500 ±	17.500 İ	12,500
1944				95,237	24,282	15,000‡	32,500 t	16,000 t	12,000
1945				96,000	28,600	15,500 ‡	33,500 ±	16,000 ±	7,000
Nine m	on	ths		-	-	• •			
1945				69,700	18,700	12,300‡	24,1001	12,100t	5.500
1946	_			73,400	24.400	12 700 †	24 600 1	12 300 +	2,500

Source: Total deaths and motor vehicle deaths 1937 to 1944 are census bureau totals, 1945 and 1946 figures are National Safety council estimates. Other figures are National Safety council estimates. Other figures are National Safety council estimates. Other figures are National Safety council approximations (rounded) based on data from the census bureau, state and city health departments and other sources.

*Duplications between motor vehicle, occupations and military personnel are eliminated in the Total column

†Approximations for these types of accidental deaths cannot be made for these

dent rates and meritorious safety activities. Iowa won the

state division of the contest in 1945; the city winner was Wichita, Kan. The decade from 1937 through 1946 saw a great expan-

sion in school, home and farm safety. Newspapers, magazines, radio and motion pictures gave a great deal of attention to safety. Hundreds of service and civic organizations began to take an active part in the safety movement for the first time. Many new state and local safety organizations came into being and many of those already established strengthened their programs. (See also Death Sta-TISTICS; INDUSTRIAL HEALTH.)

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U.S. Traffic Accidents.—During the decade 1937-46, nearly 320,000 people of the United States were killed in traffic accidents, and some 11,000,000 others were injured. Resulting economic losses, including property damage, wage loss, medical expense and overhead cost of insurance, totalled approximately \$15,000,000,000.

The fact that in the face of this grim record there were many important gains in highway safety merely bespoke the magnitude of the accident prevention problem in the most highly motorized nation on earth. For the accident curve normally had tended to follow closely the travel mileage curve. Thus, the peak mileage year of 1941, when travel aggregated 333,000,000,000 mi., was also the blackest year in number of fatalities, setting an all-time high of nearly 40,000 traffic deaths.

Motor vehicle travel in the United States multiplied six times within two decades. In 1946, with some 5,000,000 fewer vehicles on the road than the 34,000,000 operating in 1941, the vast mileage of that top prewar year was being more than equalled.

In 1937, the motor vehicle fatality rate was 14.7 deaths per 100,000,000 miles. It dropped to 12 in 1938, and remained fairly stable between that figure and 11.4 through 1941. With the sharp curtailment of motor travel in the first war year of 1942, the rate declined to 10.6, and then averaged 11.3 for the next three years.

An unprecedented decrease in the fatality rate occurred in 1946, attributable to a nation-wide intensification of safety activities, notably the President's Highway Safety conference. The conference "Action Program" provided a master plan, based on sound educational, enforcement and engineering techniques, by which states and communities could achieve maximum safety and efficiency in highway transportation. In addition, the event had the effect of making people safety-conscious on a truly national scale. From 11.4 in January the rate fell to 7.8 in August, the lowest point in history.

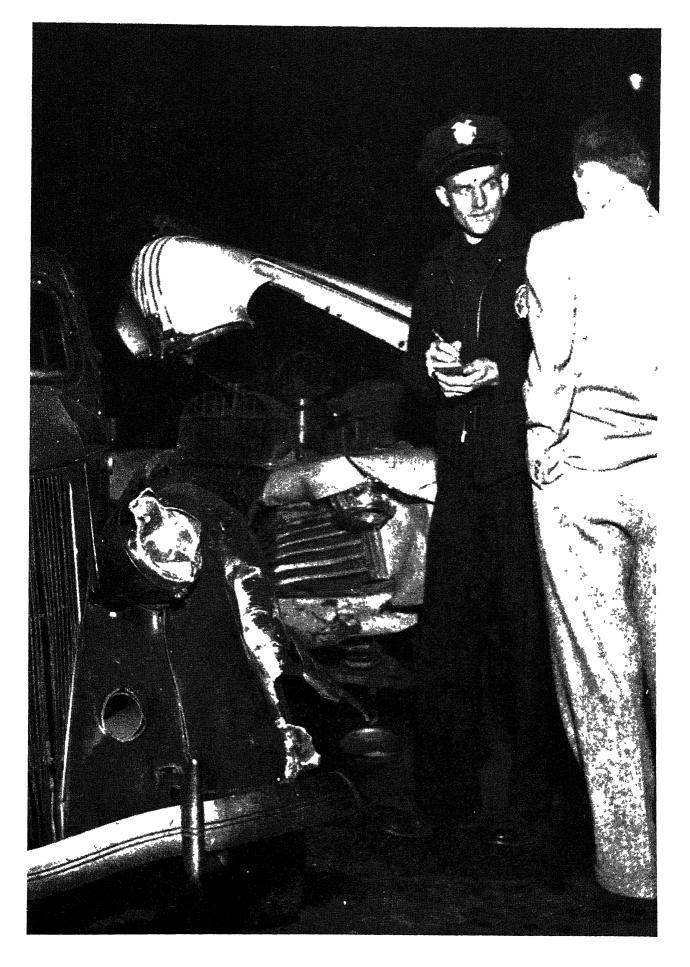
Both pedestrian and nonpedestrian deaths during the ten-year period decreased more in the larger cities than in ıural areas. Rural prewar deaths were on the rise for both pedestrian and nonpedestrian, whereas both urban trends were downward. While all wartime death tolls declined, pedestrian and nonpedestrian deaths from 1941 to 1945 fell much more rapidly in rural areas and cities under 10,000 population than in larger cities.

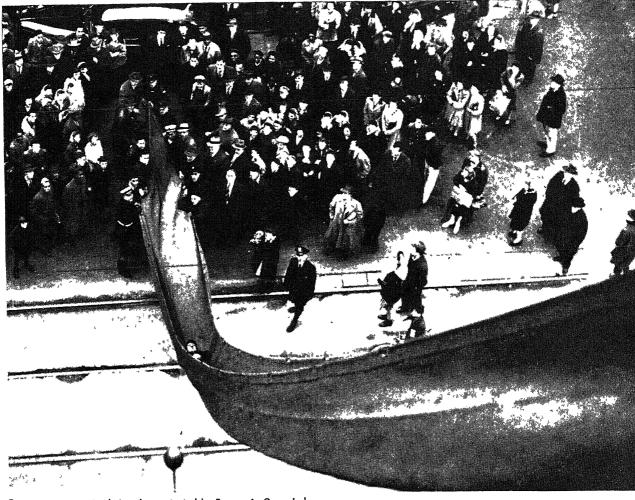
Trends at the end of the decade indicated that accident experience was reverting to the pattern which prevailed prior to World War II. Two-thirds of all traffic deaths were occurring in rural areas. Because of increased rural traffic and more effective urban accident-control measures, rural deaths increased sharply in proportion, while urban deaths showed little fluctuation.

Typical U.S. traffic accident at Los Angeles, Calif., includes the usual grotesque wreckage, gasoline leakage, traffic officer and appalled driver. Motor vehicles accounted for almost 33% of all accidental deaths during the decade 1937-46

years.

These estimates are for civilians only. The figures for earlier years include the non-motor vehicle deaths of military personnel, but there were so few such deaths that comparability is not affected.





Emergency evacuator being demonstrated by firemen in Gary, Ind. A seven-floor escape in the canvas chute averaged four seconds, as compared with two minutes by ladder

Even a brief inventory of 1937–46 safety activities disclosed substantial progress in the three basic fields of enforcement, education and engineering. Voluntary uniformity among the states in the regulation of traffic gained ground. The Uniform Vehicle code and the Model Traffic ordinances, periodically revised to keep them keyed to increasing traffic densities and design changes in both vehicles and highways, were accepted by officials and the public as recognized standards. Similarly, cities were making greater strides toward uniformity in signals, signs and road markers.

There was a widespread realization of the need for driver control through licensing, including examination, re-examination, suspension and revocation. The American Association of Motor Vehicle Administrators continued to conduct schools in various states to provide trained examiners. Only three states in the entire nation lacked an operator's licence law at the end of 1946.

As a pioneering step in selective enforcement, the International Association of Chiefs of Police in 1936 initiated a program for installing accident-prevention bureaus in city and state police departments. Their value was quickly demonstrated, when 16 cities in which bureaus were set up showed an 11.5 reduction in death rate during the first nine months of 1937, compared with the same period of 1936. This excellent program was later extended to many of the principal cities of the United States, as well as to

states. In 1946, the organization's Traffic Division made an intensive study of traffic law enforcement legislation and administrative needs for the Interim Committee on Governmental Reorganization of the California legislature. Thirty cities and six states had received traffic division service, all achieving substantial reductions in traffic fatality rates since reorganization of their traffic control programs with traffic division assistance.

The Northwestern University Traffic institute, a national centre for police training, had given basic and advanced courses in traffic control to more than 1,400 state and urban officers by the end of 1946. The institute had also established numerous regional and state training courses.

To the National Safety council belonged major credit for focusing public attention on the importance of collection and use of traffic accident records in selective enforcement. Forty-five states had enacted legislation requiring drivers to report to authorities in the event of accidents.

A national program for the improvement of traffic courts was conducted jointly by the American Bar association and the National Safety council. This needed reform was begun following publication of the noted Warren report, based on the country-wide survey of traffic laws and courts, which was sponsored in 1938 by the National Committee on Traffic Law Enforcement and the National Conference of Judicial Councils.

Traffic engineering came rapidly to the fore in the safety picture with public recognition of its vital role not only in the design and maintenance of roadways but in the scientific control of the vehicles on them. The Yale Bureau

of Highway Traffic gave specialized training in traffic engineering to graduate engineers, who then qualified for key positions with city and state highway departments.

Appreciable advances were made in all segments of safety education. Effective work was done by the National Safety council in safety organization; by the American Automobile association in driver training and pedestrian protection; by the National Congress of Parents and Teachers, the General Federation of Women's Clubs, American Legion and the National Grange in adult education; by the National Education association, Highway Education board, the Grange and the Parent-Teacher groups in child education.

One of the brighter spots in traffic safety was the accomplishment of the school patrols in the elementary schools. A third of a million youngsters were members at the end of 1946. Driver training had been instituted in more than 7,000 of the nation's 25,000 high schools in the United States.

The annual National Traffic Safety contest, sponsored by the National Safety council and the National Pedestrian Protection contest of the Automobile association, continued to be a powerful force in keeping the public aware of traffic hazards and in pointing up the need of proved safety techniques in reducing highway accidents.

In the field of engineering, the mass of valuable data collected in the highway planning surveys begun in 1935, and later in the origin-destination studies in metropolitan areas, contributed immeasurably to a realization of the close relationship between design standards, traffic volume and safety. On these fact-finding surveys would be based the planning and design of modern expressways. More immediately, the survey reports were indispensable in improving the usefulness of existing roads and streets during the postwar reconversion period when shortage of materials, equipment and labour seriously curtailed new construction.

The Federal Aid Highway act of 1944 was a striking expression of the national interest in safe and efficient highway transportation. The act provided grants of \$500,-000,000 annually for the first three postwar years, to be used for the construction of primary highways, secondary farm-to-market roads, and major arteries in urban areas. The funds were apportioned on a formula basis, to be matched in equal amounts by the states.

Culminating the decade's constructive developments was the President's Highway Safety conference, held at Wash-

ington, D.C., in May 1946, which served to integrate activities of public officials and private organizations into the most practical over-all program ever achieved. The conference recommendations, co-ordinating the tested plans and techniques of the nation's best authorities, became recognized as a balanced traffic safety objective for state and local action throughout the United States. (See also DISASTERS.) (F. M. K.)

Accidents in Britain.-Comparisons of British accident figures during the decade could not be made with any accuracy because of conditions imposed by World War II. The usual official figures were, in many cases, either no longer published, or else considerably curtailed, especially in respect of non-fatal cases. Only figures of fatalities could therefore be taken as comparable. Totals of all accidental deaths were given in the annual publications of the registrars general for England and Wales, and for Scotland, but in 1946 no figures were available later than those for 1942. In the years before the war, the numbers of persons accidentally killed in Great Britain were between 18,000 and 19,000 a year, but in 1940 and 1941 the total rose to 25,000; in 1942, however, they dropped to slightly more than 21,000. A big increase was in miscellaneous accidents and this was no doubt influenced by wartime conditions.

Table II gives the number of persons killed (excluding deaths by enemy action) during the years 1937 to 1945, insofar as the figures were available.

Road.—The road accident position in Great Britain during the years 1937-46 was largely dominated by the influence of war-time circumstances. These imposed various conditions which tended to increase risks in some directions, while reducing them in others. The black-out which was imposed at the beginning of the war greatly added to the hazards of road usage, so that the year 1941 saw a new fatality record set up (9,169), despite restrictions on all but essential traffic.

After 1941, there was an improvement which could be accounted for by several reasons. The public had become more accustomed to black-out conditions; lighting restrictions for vehicles and in streets were to some extent relaxed; air raids were not so frequent. The basic gasoline ration was abolished in June 1942 and not restored until June 1945, and a gradually intensified safety publicity campaign was undertaken. As a result, the number

of persons killed on the road during 1945 was the lowest figure in the decade (5,256). The number of injured for the months of Aug. 1939 to March 1941 inclusive was not recorded.

In 1946, current figures were not available, but tendencies indicated an increase in the number of fatalities which was only to be expected with the return of traffic to the roads. In the case of nonfatal accidents, comparisons between the war and postwar years could not be accurately made as, with the police returning to more normal duties, more acci-

Table II.—Persons	Killed in	Accidents in	Great	Reitain	1937-45

	1937	1938	1939	1940	1941	1942	1943	1944	1945
Railways*	400	373	411	532	607	528	579	559	495
Roads†		6,648	8,272	8,609	9,169	6,926	5,796	6,416	5,256
Mines ‡		858	783	923	925	877	713 1.220	623 1,003	550
Factories \		944 9.710	1,104 10,424	1,372	1,646 13,018	1,363	1,220	1,003	Ý
Miscellaneous									
Total	18 840	18 533	20 004	24 002	25 265	21 020	٥	0	0

Table III.—Persons Injured in Accidents in Great Britain, 1937–45																		
										1937	1938	1939	1940	1941	1942	1943	1944	1945
Railways*										27,169	25,373	17,866			2,830	2,680	2,814	2,612
Roads	-									226.402	226.711	t	Ť	t	140,618	116,740	124,458	133,042
Mines†										140,645	131,776	134,072	146,388	158,445	166,639	173,716	176,847	Ť
Factories‡		٠								192,539	179,159	142,371	230,607	269,652	313,267	309,924	281,578	†
Total										586,755	563,019	†	Ť	†	623,354	603,060	585,697	†

^{*}From Sept. 1, 1939, requirements for reporting accidents were limited to serious injury (including injury arising directly from enemy

Excludes deaths caused by enemy action.

*Annual Reports of the chief inspecting officer of railways.
†Annualry of Transport Returns. Road Accidents Involving Personal Injury, Great Britain, 1938 (1937–38) and Road Accidents Monthly Return (1939–45).

‡Figures furnished by ministry of fuel and power.

\$Annual Reports of H. M. chief inspector of factories.

||Principally accidents in the home and everyday pursuits.

||Registrar general's Annual Statistical Review for England and Wales, and Annual Reports of the registrar general for Scotland.

9Not available.

Not available. An accident is recorded when the sufferer is off work for three days or more.

10 dent

dents in which people were "slightly" injured were being reported. It was not certain what proportion of these came to the notice of the police in the war years. The pattern of road accidents remained much the same in war as in peace. Child fatalities were being reduced before the war, but the process was reversed when the war began, and despite improvement in the later war years, the number of children killed each year was well over the 1,000 mark. Young children between three and eight years of age, with the peak about five, remained as a most vulnerable class.

Factory.—War circumstances equally influenced factory accidents. Though the increases in both fatal and nonfatal accidents were disquieting, it should be remembered that the nation was mobilized for war production on an unprecedented scale. Many people worked in factories who were inexperienced, and many workers in the lighter and less dangerous industries were transferred to those in which more risk was involved. The decline in both categories, which operated in the later war years, indicated that some success attended the efforts of the ministry of labour and national service and other bodies to reduce the risks.

Mine.—In the mines there was an influx of inexperienced labour, but except for a relapse in 1941 there was a steady diminution of fatalities throughout the period, 1945 showing the smallest total in the period. Non-fatal accidents fluctuated to a larger extent, with a generally rising tendency.

(J. A. A. P.)

Acheson, Dean Gooderham

Acheson (1893—), U.S. government official, was born April 11, 1893, in Middletown, Conn. A graduate of Yale university in 1915, he received a law degree from Harvard university three years later. During World War I he served as a naval ensign. Acheson later became private secretary to Louis D. Brandeis, associate justice of the U.S. supreme court. He practiced law from 1921 to 1933, and in the latter year was U.S. undersecretary of the treasury, from May to November. Returning again to his law practice, he continued in this field until his appointment as assistant secretary of state, on Feb. 1, 1941.

After formation of the United Nations Relief and Rehabilitation administration in 1943, Acheson was selected as the U.S. member of the U.N.R.R.A. council. After the resignation of Joseph C. Grew, he was named undersecretary of state (Aug. 16, 1945). The following month, Acheson obliquely criticized General MacArthur by stating that the U.S. government, not the occupation force, would determine policy in Japan. The senate nevertheless confirmed Acheson as undersecretary by 69 votes to 1.

At the height of the world food crisis in the spring of 1946, Acheson suggested that the federal government should seize the grain required to meet its commitments abroad to avert mass starvation. With regard to the Argentine question, Acheson supported Spruille Braden, reiterating U.S. willingness to sign defense pacts with that country if in return the Perón regime would undertake to eliminate "axis influences." Acheson announced that U.S. policy favoured barring of foreign influences in China, but declared that the 20,000 U.S. marine troops there would remain in North China to guard supply lines from the coal areas to the coast.

Actors and Acting

See THEATRE.

Addis Ababa

See ETHIOPIA.

Aden

A British crown colony and protectorate, the Aden colony is situated about 100 mi. east of the straits of Bab-el-Mandeb on the Arabian coast, latitude 12° 47′ N., longitude 45° 10′ E.; the protectorate is bounded on the east by Oman and on the north by the desert of Rub' Al Khali and on the west by the kingdom of Yemen. Area: Aden (colony), 75 sq.mi., Perim Island, 5 sq.mi., Kuria Muria Islands 22 sq.mi.; protectorate c. 112,000 sq.mi. Pop. (est. 1939) Aden and Perim 45,992 (Mohammedans 38,128; non-Mohammedans 7,864); Kuria Muria Islands 2,200; protectorate 600,000 (Mohammedans, no census ever taken).

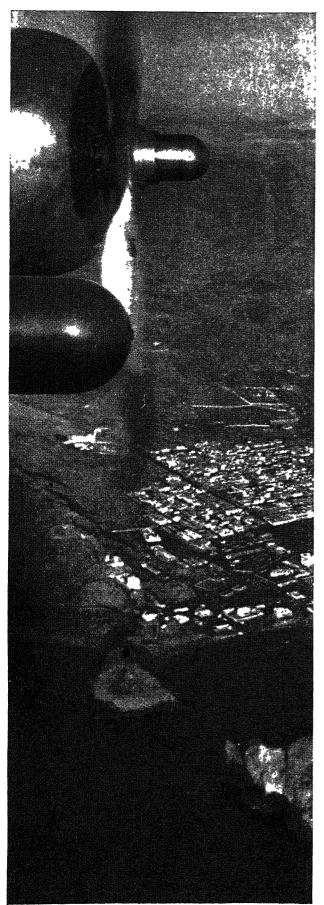
Governors (colony): Lieut. Col. Sir Bernard Reilly (April 18, 1931–Oct. 24, 1940); Sir John H. Hall (Oct. 24, 1940–Dec. 15, 1944); Sir Reginald S. Champion (after Dec. 15, 1944–).

Principal rulers (protectorate): Sir Abdul Karim Fadhl, sultan of Lahej; Sir Salih bin Ghalib al Qu'aiti, sultan of Shihr and Mukalla.

Under the provisions of the Government of India act, 1935, the administrative control of the Aden settlement was transferred from the government of India to the colonial office and on April 1, 1937, Aden became a crown colony. By the Protectorate order-in-council of 1937, the areas adjacent to the colony were transferred from the government of India to the British government. This was a normal administrative change and did not mean any lessening of the autonomy or responsibility of the chieftains.

On Aug. 13, 1937, a treaty was signed by the governor of Aden and the sultan of the Qu'aiti state of Shihr and Mukalla under the terms of which the British government was to appoint a resident adviser to the sultan whose advice the sultan agreed to accept on all matters except those concerning Mohammedan religion and custom. At the same time the governor addressed a note to the sultan in which he explained that it was by no means the intention of the British government to reduce the powers of the sultan and that the advice given to his highness in all matters of internal concern would be based solely on the adviser's views of the interests of the state and of his highness. A similar adviser treaty was signed by the governor and the Kathiri state of Saiun on March 2, 1939, and on the same date an agreement was signed by the British government and the sultan of Shihr and Mukalla and the sultan of Saiun reconstituting the agreement of 1918 which provided for mutual co-operation between these two states of the protectorate, the British government undertaking to settle any differences that might arise between them. Early in 1937, a general peace treaty for three years was arranged between the warring tribes in the Hadhramaut. The fact that there were nearly 1,400 signatories gives some idea of the unsettled state of the country. The treaty was extended for ten years in 1940, and on the whole was loyally adhered to. In the Qu'aiti state an efficient police force was built up, and by 1944 incidents

In the autumn of 1938 there was some trouble on the Yemen borders. Yemeni irregulars who had occupied Shabwa for about two months eventually surrendered to the protectorate authorities. There was further unrest in this region in 1939, but the king of Yemen intimated that he intended to adhere to the treaty of San'a signed by Great Britain and Yemen in Feb. 1934. These border



and tribal incidents were magnified by the German and Italian press and used as anti-British propaganda. In 1939, the centenary of the capture of Aden by a British naval and military mission was celebrated; a centenary fund for the establishment of infant welfare clinics and a scheme for permanent relief of the poor were started.

The sultans supported the Allied war effort loyally and to the best of their ability. Aden was one of the territories served by the middle east supply council, which was set up to look after the civilian needs of territories cut off from their normal source of supply. The governor was also a member of the middle east war council and the sub-committee of the middle east war council on supply and transport. The fall of Singapore and Java meant the loss of over £600,000 a year in remittances to the Qu'aiti state and this, added to the shipping problem, the loss of 50% of the working camels and the difficulty of getting food and its high price, had a grave effect on the protectorate, particularly the interior. A very severe famine hit the Hadhramaut in the spring of 1944 following a seven years' drought. The British government voted £300,000 for relief and rehabilitation and the R.A.F. provided air transport for grain. Hospitals were improvised and some 16,000 persons fed daily at emergency food kitchens. In the Qu'aiti state, merchants and government servants made voluntary contributions towards relief, and considerable sums were raised by local charity.

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(J. RA.)

				(J)				
	Aden: Sta	tistical Data						
	193	88	19	1940				
	Value	Amount or	Value					
Item	(ooo's omitted)	Number	(ooo's omitted	Amount or) Number				
Exchange rate		Indian Rupe ≈ 1s.6d. 36.6 cents)	e	1 Indian Rupee = 1 s.6d. (30.15 cents)				
Finance								
Government revenues	£169 (\$824)		£215* (\$822)					
Government expendi-	**		(4022)					
tures	£127 (\$621)		£152† (\$583)					
Minerals Salt	3	11,411 tons						
		1						
Goats and Sheep Cattle		11,300						
	CO 007	1,600						
•	£3,097 (\$15,143)	•••	£2,198 (\$8,417)	•••				
Piece goods	£520 (\$2,544)	•••	£562 (\$2,152)	46,681,000 yd.				
Grain and pulse	£355 (\$1,734)	•••	£202 (\$772)	23,000 tons				
Skins (raw)	£352 (\$1,723)	•••	£348	2,000				
Imports—Total		•••	(\$1,334) £4,449 (\$17,040)	tons				
Oils	£1,805 (\$8,826)	•••	£1,453 (\$5,564)	5,299,000 tons				
Grain and pulse	£512 (\$2,504)	•••	£324	38,000				
Piece goods	£508 (\$2,483)	•••	(\$1,241) £417 (\$1,598)	tons 47,462,000 yd.				
*1943 Revenues: £155 †1943 Expenditures: £9			,, ,,,-,	,				

Adjusted Compensation

See VETERANS' ADMINISTRATION.

Administrative Law

See Law.

Adult Education

See EDUCATION.

ATC plane over Aden, a station on the U.S. air transport command route from Miami, Fla., to Chabua, India, during World War II. Cargo was flown from Chabua over the Himalayas into China 12 Advertising

As in all other phases of the U.S. and British economies, World War II was the greatest influence upon the changes in markets, in advertising volume, in media, in methods of advertising and in distribution and retailing. Over the ten-year period 1937–46, however, there were also technical advances, valuable new information developed by research, and changes in the habits of the people, all of which had their effect upon advertising.

Fundamentally, there was a change in the prosperity of the U.S. In 1937, the nation was still climbing out of the great depression that began with the stock market collapse in 1929. In the autumn of 1937, for instance, there was a sizable recession in prices of securities and in business activity. The economy gradually improved, however. The national income that stood at \$71,500,000,000 in 1937 rose to \$96,857,000,000 by 1941 and to \$161,000,000,000 by 1945. This great prosperity affected all income groups, but especially those in the lower brackets who were less subject to the heavy taxation of war and were thus brought into the active spending groups.

Studies by the former National Resources committee for the year ended June 30, 1936, and by the bureau of agricultural economics and the federal reserve board for the year 1945 defined this trend. These studies showed that only 47% of the families in the U.S. had incomes of less than \$2,000 a year in 1945, compared with 81.5% in this lower bracket before World War II. Medium incomes, between \$2,000 and \$4,999, were received by 45% of the families in the later year, compared with only 16% before the war. It was also estimated that the average wageearner family had two-and-a-half times as much income left in 1945 after paying taxes and basic living expenses as it had in 1939. This was somewhat better than the average of nonagricultural families. However, the latter families were also better situated; it was estimated that farmers in 1946 had about \$15,600,000,000 for spending or saving, or about three times their prewar net income.

This rise in national income made possible expenditure of more advertising dollars. The increase was approximately \$450,000,000 from 1941 to 1945, according to figures compiled by L. D. H. Weld. Every medium benefited, with the exception of direct mail; radio and magazines scored the greatest gains. Figures for the two years are as follows:

Advertising Expenditures (Millions of dollars)

																						1941	1945
Newspapers.																						\$610	\$660
Radio	•							٠														225	400
Magazines .	٠	٠	٠		٠	٠		٠														180	330
Direct Mail .	٠	٠	•		٠	٠		٠	٠	٠		٠					٠			٠		315	270
Trade and bus	in	ess	F	90	P	ers	٠.	٠	•	٠				٠								55	107
Outdoor	٠	•		•	٠		•	•														65	90
Farm Papers	•	٠		•	٠	٠	٠	•	•	•			٠	•			•	•					29
Miscellaneous	٠	•	٠		•	٠	٠	٠	٠	٠	•	٠	٠	٠	٠	٠	•	•	•	٠	•	454	500
																						\$1,920	\$2.386

Surveys by Standard and Poor's indicated that advertising would continue to grow, pointing out that from 1934 through 1940 there was a direct relationship between national advertising expenditures in five media and national income. The paper shortage that developed in 1941 distorted this relationship, but it was expected that with improvement in this respect, total advertising volume might resume its increases with those in national income, and that advertising expenditures might reach a total of \$3,000,000,000 annually, or well above the previous peak

of \$2,600,000,000 in 1929.

Newspapers.—During World War II, advertising in newspapers did not increase so much as advertising in other media—in radio and magazines, for instance—but it remained at a dollar value substantially higher than in other media. The rise was from \$610,000,000 in 1941 to \$660,000,000 in 1945.

One of the outstanding prewar developments in newspapers in the United States was an increasing willingness on the part of newspaper representatives to discuss the wide differentials between local and national advertising rates. There was also a growth in circulation. Total daily circulation rose from some 42,000,000 in 1941 to 48,300,000 in 1945, and Sunday circulation increased from 33,500,000 to 39,800,000 during the same years.

Two major ways in which World War II affected newspaper advertising in the U.S. were the newsprint shortage it created and the types of public service advertising campaigns that were engaged in by newspapers as part of their contribution to victory.

Restrictions on the use of newsprint were met by many expedients on the part of newspapers. Limitations on classified advertising were universal, effected through dropping out-of-town help-wanted advertisements, limiting the number of lines in each advertisement, reducing space for display and using agate type. The editorial side co-operated by compact writing and editing of news stories and other editorial material, reduction in features, slashing of comics, women's pages and financial news. Publishers preferred, however, to omit advertising rather than impair news coverage.

The next move in the conservation of paper was the curtailment of local retail and national advertising. Some papers adopted a 1,000-line ceiling and limited the number of insertions. Margins were cut down, and the number of editions was reduced. Optional insertion dates were urged upon advertisers.

Throughout the war, newspapers supported 50 or more government war and reconversion projects through editorial columns and advertising. From August 1943 through July 1945, war advertising in daily and Sunday newspapers in the U.S. totalled \$98,813,358, averaging more than \$4,000,000 a month. Chief projects were war bonds, \$42,597,445; Red Cross, \$6,252,678; armed forces recruiting (sponsored) \$5,133,385; waste paper and salvage, \$4,453,725. Total paid advertising with exception of war bond advertising was \$51,874,543; that donated by newspapers, \$4,341,370.

In its annual Blue Book, the American Newspaper Publishers' association in 1944 traced the growth of wartime advertising in newspapers and showed how it laid the foundation for reconversion by presenting factual case histories of campaigns by 75 advertisers and 56 advertising agencies.

In 1945, newspapers formed an organization to include both daily and Sunday papers for the promotion of use of newspapers for advertising in competition with other national media. National advertisers were offered the advantage of group rates for market coverage by regions or the entire country, each group of newspapers being sold as a single unit. In a similar bid for a larger share of advertising, the Weekly Newspaper bureau of the National Editorial association was created to improve weekly newspapers through better business practices in connection with advertising.

In Great Britain, by 1941, newspapers were reduced from 24 and 36 pages to 4-page size, and more than 170 publications disappeared from the newsstands by the end

of 1942, although 30 new periodicals were launched. Advertising copy in British newspapers during World Wai II stressed the fact that the nation was in a total conflict. Both government and private industry ran service advertisements. Advertising was still telling a sales story as changes and cheaper materials became necessary in products. In spite of the curtailment it suffered, advertising did a wartime job to find new ideas to build morale and help protect the people.

The end of the war did not remove rationing of paper in Great Britain, as it did in the U.S. Most of the big nationals, the Sunday and daily London papers, were still limited to four pages, and advertisements were still restricted to space three inches deep by two columns wide. This small space was forcing the advertiser to get his message into 35 or 50 words and the art director to achieve distinctive appearance and good visibility in spite of the small space at his disposal. An indication of the extent of this restriction in newsprint was that newspapers in Great Britain used only 290,000 tons in 1945 compared with 1,100,000 in a prewar year.

Another necessity forced upon the advertiser was the creation of advertisements that lent themselves to expansion horizontally or vertically and to treatment in sizes of diverse proportions. In a motor car advertisement, for instance, as many as 50 resizes might be used, a multiplicity of forms caused by lack of standardization of page sizes and column widths and the spaces of unusual dimensions offered advertisers by paper-starved publications.

Many British manufacturers who discontinued advertising early in the war started again as soon as the industrial scene adjusted itself. To cope with this increasing demand for space in smaller newspapers, the size of advertisements was reduced progressively from eight to four and one-half and finally to three inches by two columns, which was fairly standard in the first year and a half after the war. However, even this was not adequate, and the frequency of insertions had to be cut, so drastically that most publications soon limited insertions to one a month. This situation was not eased after the war, but rather it became aggravated as more manufacturers returned to advertising or as new advertisers arrived on the industrial scene.

Actually the allotment of one insertion a month was liberal, for emphasis was on less space. In the nationals a big advertiser could average no more than one insertion each three months, and in such important provincial papers as the *Manchester Guardian*, *Birmingham Mail* and *Liverpool Echo*, advertisers could count upon no more than two insertions a year. This allocation of space was watched carefully by advertising agencies to make sure that their clients did as well as competitors. However, apportioning of space proved to be invariably fair.

Papers might have eased their restrictions on advertising by increasing proportion of their space devoted to advertising, but generally they refused to do this. Legal maximum of advertising was 40%, but the Daily Express, for example, allocated only 14% of its space to advertising, and the Sunday Express 12½%. Other cases were the News Chronicle, 18%; Daily Mail, 17½%; London evening papers, 24%. The Times and Daily Telegraph, having had more pages in the first instance, allocated 38%, including classified advertising.

An important exception in reference to size restrictions was government advertising. During the war such campaigns used copy as large as two columns 11 in. deep, but the average size allotted to the government was about two columns by eight inches. This space was reduced to five inches after the war because of pressure by manufacturers



Will change the three productions the second of the second

Prize-winning U.S. advertisement of the 1938 Annual Advertising awards

for more space for their own use. However, government advertising continued an effective instrument for influencing public opinion toward waste of food, saving, spending, recruiting, safety on the roads and other matters.

Lack of foreign exchange forced the government after the war to urge industries to export certain specified percentages of their products, and the resultant shortages at home were reflected in advertising. Manufacturers often used advertising not to get immediate orders, but rather to keep their names before the public, to keep customers in contact with dealers and to explain delays in deliveries or production. Associations and industry-wide advertising groups were active, typical campaigns being those conducted by the Scottish Oatmeal Millers' association and the Brewers' society. The latter was seeking to create goodwill for inns and taverns. (See also Newspapers and Magazines.)

Radio.—Radio scored one of the biggest gains of any advertising medium during the war, its revenues rising from \$225,000,000 in 1941 to \$400,000,000 in 1945. However, there were substantial increases in costs also. Cost of talent was approximately 50% greater toward the end of the war than it was in the beginning; in the 1940–41 season, for instance, aggregate talent costs for network and commercial programs were in the neighbourhood of \$30,000,000 for nighttime and \$7,500,000 for daytime programs, while in the 1943–44 season corresponding costs were \$45,000,000 and \$10,000,000.

Scarcity of good network time forced many national advertisers into spot radio. Effectiveness of their experiments was indicated in the rise of spot radio sales from \$37,000,000 to \$59,000,000 between 1940 and 1943. Moreover, advertisers who found that they could not get all the space they wanted in their local newspapers turned to their local radio stations, with the result that such time sales increased \$20,000,000 in the first two years of the war.

Commercially sponsored television programs were intro-

"Hello Mom, It's Me!"



Among the 100 advertisements judged to have contributed most to the U.S. war effort in 1945 was this advertisement prepared for the Bell Telephone system. Awards replaced for the duration of the war the former choice of a "best" advertisement for the year

duced in 1941. On July 1, 1941, sponsored programs were televised by CBS, Dumont and NBC in New York city. Sponsored television, as well as frequency modulation (FM), became one of the first casualties of the war, and it was not till the conclusion of that period that interest was revived. Both were still in the stage of being young industries.

In mid-year 1946 it was announced that a \$60,000,000 television motion picture production centre for networks, radio and telecasting stations, national advertisers, advertising agencies and independent producers would be built in the New York metropolitan area. The "Telecity" was to cover 1,000 acres, include 24 large motion picture studios and every type of maintenance building, service and facility required.

In the prewar years, an interesting development in 1938 was a study by the joint committee on radio research of the methods of determining the areas in which programs of individual broadcasting stations were heard. Advertising messages became more closely integrated with entertainment features in this period, and transcriptions came into wider use. In the United Kingdom a poll of 500,000 listeners revealed that 95.6% preferred sponsored programs, originating at a continental station, to non-commercial programs of the British Broadcasting company.

By 1940, advertisers in the U.S. were spending \$200,000,000 for time on radio stations, and it was estimated that there were some 52,000,000 radio sets in use. In June of that year the Associated Press approved full commercial broadcasting of news. During the year the Federal Communications commission approved FM. FM made more stations possible than the 550- to 1600-kilocycle band permitted, and provided static-less reception.

In 1941, advertisers in the U.S. spent \$107,500,000 for time on the three major networks, an increase of 11% over the previous year. They spent \$35,000,000 on programs, an increase of 24%. This disproportionate increase was caused by some shifting from quiz programs, which were relatively inexpensive, to more costly variety shows. News broadcasts increased greatly with the war, and advertisers capitalized on this greater interest by increasing their commercial sponsorship of news reports. Both stations and sponsors contributed time generously to the defense and war efforts. It was estimated that stations on the average devoted 760 min. and 227 announcements to the defense efforts in the month of July 1941. With entry of the U.S. into the war, most stations entered upon a 24-hr. schedule and broadcast news every hour or half hour.

British commercial radio broadcasting was virtually nonexistent before the war. The BBC, owned by the government, had never permitted sponsored commercial programs, and the two chief radio stations on the continent which accepted commercial programs for British advertisers, ceased to operate because of the war. These were Radio Normandy and Radio Luxembourg.

Radio in the U.S. saw a great year in 1944, with estimated gross time sales of \$350,000,000. It was figured that the amount of time and talent devoted to the war effort during the year was \$66,141,000.

The first year, 1946, after the war saw confusion over broadcast measurement services. After 1942, when the Cooperative Analysis of Broadcasting, Inc. (CAB) fundamentally changed its research methods, broadcasters were faced with the dilemma of choosing between the two major radio audience rating services, C. E. Hooper, Inc., and CAB, both of whom claimed to measure the same thing and use the same basic method, but between whose ratings there was a marked difference. In the summer of 1946, the CAB decided to suspend its operations, and later in the year voted itself out of existence.

In mid-1946 the Broadcast Measurement bureau announced that it would begin to provide information on radio station and network audiences. BMB was a cooperative enterprise supported by the American Association of Advertising Agencies, the Association of National Advertisers and the National Association of Broadcasters. The new service would provide information on sizes and locations of station and network audiences and was to be published in two forms, station audience reports and a U.S. area audience report.

The composition of radio programs was about the same at the end of the war as it was at the beginning, although wartime security regulations cut "audience participation" shows one-third. Drama occupied the greatest percentage of time on the air, with variety shows, commentators, news and talks, popular music, familiar music and classical music following in that order. An obvious change was the advent of the singing commercial, conspicuous examples being the Pepsi-Cola song and "Chiquita Banana." (See also Radio.)

Magazines.—Expenditures for advertising space in magazines in the U.S. during World War II were almost doubled, increasing from \$180,000,000 in 1941 to more than \$300,000,000 in 1945. They also emerged from the war with greater circulations than before it. These gains were due in large part to the curtailment of other forms of entertainment for magazine readers. The first year after the war saw a considerable number of magazines either announce new higher advertising rates and circulation guarantees, or indicate plans to do so. In this period there were also more than 50 new magazines launched, accord-

ing to the Magazine Advertising bureau, appealing to a wide range of interests.

The gain in the average net paid circulation of 21 leading magazines was 12% in the period from 1941 through 1945, according to the Association of National Advertisers. This report also revealed that the war had reversed sharply the trend from newsstand sales to subscription that had prevailed during the 1930s. It showed that subscription circulation gained 62% in the years 1930-40, but only 4% during the war period. Newsstand sales showed the opposite development, having gained only 8% during the 1930s, compared with 55% after 1940.

One of the outstanding developments of this period was the growth of comic books. The first of these appeared in 1933, but they had a spectacular growth during the war, and by the end of 1946 one publisher, with 26 books or titles, boasted circulation of 26,340,000.

A study conducted by the Market Research Company of America in 1944 revealed that of all homes interviewed, whether with or without children, nearly three out of four had one or more members who read comic magazines. Of children 6 to 11, for example, 95% of boys and 91% of girls read comic books regularly. A study by Stewart, Brown associates in 1945 showed that children readers of comics had very definite preferences for brands of goods. Not all publishers of comics accepted advertising, but those who did were careful to see that claims made in advertising could be substantiated, as such a large part of the circulation was to children. At army post exchanges throughout the country, comic books outsold all other magazines ten to one.

Even before the war there were gains in circulation of magazines, however. Twenty-one leading magazines issued a total of 1,103,000,000 net paid copies in the 12-months' period ending June 30, 1941, a gain of 5.5% over the corresponding 1940 period. Two or three magazines began to distribute their copies in substantial numbers by air express to South America.

During the first year of U.S. participation in the war, circulation continued to gain. Net paid circulation of 78 leading magazines increased 4,285,513 or 7.2% during the first six months of 1942 over the corresponding period in 1941. Many magazines reached all-time highs during the year in both circulation and revenue, and others reported substantial gains. During these months, an analysis of 30 magazines showed that 48% of nonfiction content and 65% of editorial matter were devoted to war themes. Both editors and advertisers furnished information highly important to readers and co-operated in prompting conservation and building morale. There was direct co-operation with the government in distributing messages with regard to purchase of war bonds and stamps, and some sponsored nutrition programs or urged consumers to do their part in making home, community and country ready, efficient and strong, or to buy carefully and avoid waste.

The following year showed continued gains. In spite of nationing of paper in 1943, magazines as a whole carried the largest volume of advertising in their histories. Although \$50,000,000 of advertising was refused in 1943 because of paper shortage, 105 magazines reported gross revenue of \$228,000,000, compared with \$174,582,000 in 1942 and \$196,687,000 in 1929, the year of the great boom. Ten publishers, including The New Yorker, Newsweek and Life, published and distributed free of charge miniature editions for use of servicemen overseas. These overseas editions carried substantially the same editorial matter but no advertising.

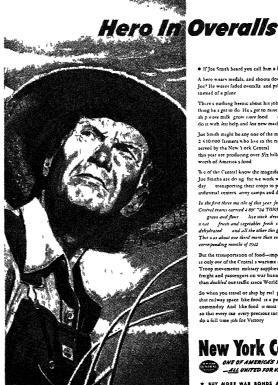
For these magazines checked by the Publishers Infor-

mation bureau and reporting advertising revenues of \$228,000,000 in 1943, the revenue was \$270,000,000 in 1944. Although the magazines had to operate under the same paper restrictions as in 1943, they were able to increase advertising considerably by reducing weight of stock used and by closer trims. However, many publications had to refuse demands for space. Advertising volume in business papers also increased, rising 24% during the year. Time magazine expanded its editions to 20, 4 for the U.S. and 16 for other countries.

In 1945 magazine advertisers increased their volume to \$300,000,000, compared with \$270,000,000 for 1944, although there were still paper restrictions. An outstanding accomplishment was the promotion of Seventh War Bond sales through more than 3,000 cover displays and full-page advertisements donated by the magazines and advertisers. Magazines continued to co-operate with the government on all war and peacetime campaigns, including the Economic Stabilization program.

Outdoor.-Outdoor advertising was a medium considerably affected by the war. It was affected by shifts in population incident to the situation of war industries and military establishments, by dimouts against submarines, decline in motor travel and shortages of manpower, including that needed for traffic audits. However, the lifting of dimout regulations and the end of gasoline rationing after V-J day quickly stimulated U.S. interest in this medium. During 1945, there was an increase in national advertising volume of 40% over that for 1944. A greater part of this growth came from automotive and accessories fields. According to Traffic Audit bureau figures released in the fall of 1945, effective circulation of outdoor advertising

Advertisement prepared for the New York Central system, one of the 100 advertisements adjudged to have made the greatest con-tribution to the U.S. war effort in 1943



If Joe Smith heard you call him a hero he d laugh A hero wears medals, and shoots down Zeros. But Joe? He wears faded overalls, and pilots a plow

There's nothing heroic about his job to Joe. It's a thing he's got to do. He's got to raise more hogs ship nore milk grow riore food and he's got to do it with less help and less new machinery.

Joe Smith might be any one of the more than 2 410 000 farmers who live in the rich farming area served by the New York Central whose farms this year are producing over 3½ billion dollars worth of America's food

We of the Central know the magnificent job these Joe Smiths are doing for we work with them ever day transporting their crops to processing andustrial centers army camps and docksides

In the first three mo this of this year for example.

Control trains carried 490° 24 TONS of farm products

grain and flow. Inc stack drawed and careed

nest front and textables fresh canned and,

deliphraced and all the other things people and.

This was about our three three things to people and,

This was about our three three this in the

corresponding months of 1942.

So when you travel or ship by rail please remember that railway space like food is a perishable commodity And like food it must be conserved



in 206 cities was 23% greater than at the time of the previous audits during 1938–42, although there were wide variations within geographical sections.

During the early 1940s, progress was made in placing the purchase of outdoor space upon a more factual basis, similar to the purchase of space and time in other comparable media. Moreover, the growth of supermarkets and self-service chain stores and the expanding use of open display in all types of retail outlets reduced or eliminated influence of sales clerks on consumer purchases, and placed greater emphasis on product and label identification and consequently on the use of outdoor advertising in shopping centres or on roads leading to them.

In 1939, for example, it became possible for the first time to buy outdoor space in nine different intensities or degrees of coverage, in comparison with the three available formerly. Also new was the guaranteeing of minimum circulation, based on traffic counts. Statistics on circulation of outdoor advertising grew to cover 65% of all advertising space in 17,000 communities.

In 1940, measurement of outdoor circulation by the Traffic Audit bureau was extended to all members of the Outdoor Advertising association. This brought an improvement in outdoor plants and an audited circulation increase of 7.5% for 1940 compared with 1935.

Practically complete standardization of structures and services came by 1941. This resulted partly from the activities of the Outdoor Advertising association and partly from the extension of the services of the Traffic Audit bureau, which audited practically every outdoor plant in the U.S. every three years. Each panel was given a rating by the bureau, and plant operators undertook to re-locate those with low ratings to spots where their ratings would be improved.

Effect of the war was felt in an extreme way in 1942, especially because of reductions in motor travel, dimouts and shifts in population to war production centres and military camps. These facts, and the shortage of manpower available to make the counts, interrupted auditing of outdoor circulation. However, there were some indications that circulation was greater than ever before, that lessened motor travel had been compensated for by greater travel on foot and in buses and other such conveyances.

Traffic Audit bureau tabulations were resumed in 1943. Reports for the May 15-June 30 period, based upon 105 cities, showed that in comparison with the 1939-1941 audits, 65 cities gained in effective circulation, 36 decreased, while 4 remained the same.

For the spring of 1944, the effective circulation of outdoor advertising in 181 cities was 8% greater than it was at the time of previous audits from 1938 to 1942. Of the 181 cities surveyed, 116 showed increases in effective circulation. After the last audits, a shift in modes of travel had taken place, with pedestrian travel increasing 75%, streetcar and bus 70%, and automobile and truck traffic decreasing 9%.

During the war, outdoor advertising carried treasury and civilian defense appeals to the public, sponsored by local and national advertisers and by the outdoor medium itself without any cost to the government.

Direct Mail.—Expenditures on direct mail fell off; for one reason, there was a reduction in novelty mailing pieces, probably because of their greater cost. The medium changed somewhat in nature. Printed promotion geared itself largely to the war effort, and users of direct mail tied in their appeals with the various major wartime projects. A guide book which was helpful to users of printed promotion in this effort was issued by the Graphic Arts Victory committee. This committee was also helpful to all types of organizations in successfully using the convention-by-mail method, resulting in hundreds of conventions being cancelled and thus contributing greatly in relieving demands on transportation. The committee also pointed out many ways to make paper go further in use. Catalogues, directories and shopping newspapers were assigned paper quotas limiting them to 85% of 1941 usage.

Restrictions caused direct mail volume to shrink during the first part of 1945. Near the end of the year, however, printers were flooded with orders for new catalogues and promotion of all kinds.

A study of direct mail pieces, catalogues and technical books showed that illustrations, layout, copy and physical size of mailing pieces influenced reading by recipients and indicated that the effectiveness of direct mail was dependent primarily upon advertisers. Among executives, 63% preferred small mailing pieces, while 95% of the purchasing agents interviewed liked uniformity in size of catalogues.

After V-J day the Graphic Arts Victory committee ceased to function, having completed successfully its function of putting printing, lithography and all devices of the graphic arts into the war effort. Millions of printed promotion pieces devoted to war and victory campaigns attested their worth in the war program.

Transportation Media. — Transportation advertising flourished during the war because of the lessening of automobile traffic caused by gasoline and rubber restrictions and the great increase in the numbers of war workers who had to use commercial transportation. During the first year of the war alone, the number of passengers on buses and trolley cars increased to a total of 20,000,000,000, and the volume of transportation advertising grew 33%.

In 1940 an innovation in car card advertising was the new space offer of 11 by 28 inches at the same rate as the old standard 11 by 21 inches. In March 1942 the National Association of Transportation Advertising Inc. was formed to co-ordinate the work of the industry, to maintain standards of practice, and to engage in research and promotion.

In 1943, transportation showed the largest percentage gain of any major medium of advertising. Volume at \$10,000,000 was 20% higher than in 1942. Many cities were completely sold out, with practically all space reserved for months ahead, and rate increases were prevalent. Most national advertising continued to be on branded goods, chiefly foods and drugs. The industry's war campaign pool contributed approximately 100,000 free spaces a month to the government for war messages. Carded vehicles increased slightly, numbering 85,000. Riders that year exceeded 22,000,000,000. In 1944, the volume increased to an estimated \$13,000,000, with most systems carrying about all the advertising they could accept.

Riders and revenue continued to rise in 1945, with transit riders numbering more than 23,000,000,000, an all-time high, and revenue being about \$16,500,000. This rise was curtailed toward the end of the year with suspension of wartime gasoline restrictions. At the end of the war the transportation advertising war campaigns pool was discontinued, but 50,000 car card spaces a month were given to the Advertising council for peacetime public service campaigns. Surveys showed that eight out of every ten adults were riders and exposed to the displays.

Copy and Layout.—During the decade 1937-46, the outstanding changes in copy and layout resulted from the

war. Shortages in paper in Great Britain reduced the advertising space available to an individual advertiser to miniature size, necessitating great compactness in copy. Need to resize advertisements to fit the multiplicity of sizes of space offered advertisers, made it necessary to have flexible layouts everywhere. War themes and subjects incidental to war occupied a dominant part of advertising

Over the whole period, readership studies became increasingly popular. Advertising technicians learned by the study of these reports to prepare advertising which had greater readership. Individual advertising agencies reported that by paying particular attention to developing readership they had increased it for some of their clients by as much as 100% to 150%, although the average over the period was nearer 24%. Studies of types of copy treatment showed that advertisements about people and "How To" advertisements were read most, while treatment that featured striking events, broad general assertions, or advertisements about products as such were less well read on the whole.

Toward the end of the period there developed a desire on the part of advertisers and their agencies for studies which not only showed them the relative readership of various advertisements, but also indicated the relative power of advertisements actually to make sales.

As early as 1937 there was noticeable a tendency toward more direct and terse copy, a tendency obviously borrowed from radio broadcasting. Humour became more prevalent, and the comic strip form of advertising came to be used, with some 300 newspapers in the U.S. arranging to publish such advertisements on their comic pages. Following the social security programs introduced into the United States in the 1930s, there was greater awareness on the part of industry of its social responsibilities and a greater tendency to explain to the public the ways in which individual business organizations were carrying out their contracts with the public. This led to the development of goodwill and institutional advertising. In the U.S. large manufacturers, banks, insurance companies and public utilities emphasized this type of appeal. In the United Kingdom, the post office and other government agencies used institutional advertising.

Technical changes included shorter and more rhythmic headlines, bleed-type illustrations, rotogravure and other varieties of colour advertising used more extensively, and more photographs reproduced.

In layout the trend toward photograph and caption developed to the point where it was common to find several photographs in an advertisement where formerly one or two were considered adequate. Moreover, photographs largely replaced line drawings. The question-and-answer technique was transferred from radio advertising to printed advertising. In spite of the war, humour persisted to a marked degree in British advertising. However, British copy themes began to be built around new arguments as to why products were good in wartime. Many advertisers of products such as motor cars, whose sales were controlled, continued advertising in order to keep their names before the public, but devoted their space to institutional and patriotic messages. Advertisers of such products as gasoline, motor oils, tea, margarine and other products subject to government pooling and control, discontinued advertising completely.

By 1941, U.S. advertisers had not been turned in any substantial fashion from product selling, and in a survey it was estimated that 96% of advertisements were directed definitely at selling goods and services. The remaining 4% consisted of advertisements either showing a man in uniform using the product or a military background, or else were institutional in that they merely described the contribution of the company to the defense effort. Some companies, although they had no goods to offer to the public, continued to advertise their products on the ground that they would be available as soon as the war was over.

After the United States entered the war, as materials became scarce or unavailable for the manufacture of civilian goods, and as more and more industries converted all their energies toward war production, the nature of advertising also changed. The government recognized the usefulness of advertising, and used paid advertising extensively in promoting the recruitment of army and navy personnel, in selling war bonds and stamps and in publicizing various drives. Individual companies also paid generously for advertisements in connection with salvage drives, grease and fat conservation and similar campaigns. All advertising took on a patriotic fervour, illustrated by pictures of tanks, planes and military men.

There was a bit of confusion early in the war years as companies tried to be both patriotic and still tell their individual stories. Gradually the advertisers began to tell, in factual statements, what U.S. industry was manufacturing and the job that the United States as a nation had to do. The cartoon-continuity technique, which had proved so successful in prewar years, fell off considerably, as it did not lend itself so readily to the dignity that advertisers felt should accompany such messages.

Wartime advertisement, prepared for the war finance division of the U.S. treasury department to promote the sale of war bonds. It received an award as one of the 100 advertisements which made the greatest contribution to the war effort in 1943



YOU WRITE A LETTER to a Prisoner of

nd when you sit down to write tell him buy your share of War Bonds last pay day Dear Joe 'you might say, the old topo

out Joe might not unde ally if he a shivering in a da Let s try again Dear Joe I ve been w hard and haven t had a vacation in over a y Hell better cross that out, too They of tions where Joe's staying

Well what are you waiting for? Go ahead, write the letter to Joe Try to write it anybow



The tone of advertising improved in 1943. Much of the copy became more realistic and informative. Advertising became aware of public and government sentiment against commercializing patriotism in print and boasts of contributions toward winning the war.

As the war drew to an end, as a sellers' market continued but the prospect of a buyers' market became likely, some advertisers abandoned the public relations, institutional types of advertising they had perforce used during the war and turned to selling copy. There began to be greater use of product-selling copy in industrial advertising. During Sept. 1944, 77% of advertisements were devoted to selling products or services, an increase of 50% over April, while war copy dropped from 22% in April to 12% in September. Efforts to bridge the transition to peace produced unusual and worthwhile campaigns dealing with product shortages, social and political problems and appreciation of others' activities in the war effort.

War and Advertising.—U.S. business contributed to the war effort more than \$1,000,000,000 of advertising space and time in three and a half years. It participated in more that 100 homefront campaigns in co-operation with 27 government departments and agencies, informing the nation about war bonds, armed forces, V-mail, merchant marine, civilian nurses, food rationing, salvage and civilian services. Business organizations contributed an estimated \$350,000,000 in advertising space and time in support of war bond promotion alone.

A survey by the American Marketing association in 1943 showed that 86% of management and advertising executives believed business had a responsibility in disseminating information to the home front, expressing a strong preference for voluntary contributions of advertising space and time, rather than appropriation of government funds for this purpose.

Much of this wartime advertising activity was under the leadership of the War Advertising council, which was organized in the spring of 1942 by advertisers, advertising agencies, magazines, newspapers, direct mail, mechanical craftsmen and other branches of advertising. The council was designed to offer to the government the volunteer services of every type of talent and experience relative to the creative or administrative phases of advertising, merchandising and marketing.

After V-J day, the organization changed its name to the Advertising council, and continued its efforts in peacetime by taking over the administration of pooled media facilities formerly handled by the Office of War Information. All branches of advertising continued financial support to the council.

In 1946 the council adopted three campaigns on which to work: atomic energy, world trade and inter-group understanding.

In Britain, early in the war, advertising continued in considerable volume for products not greatly affected by government restrictions and which had "relief" and "escape" appeals, such as cigarettes, soap, liquors, cosmetics, beauty preparations, household aids and sweets. As restrictions became more severe, this advertising stopped. Advertising agency and publication offices were decentralized into units in different sections, so that if one was bombed activities could go on in the others. All available advertising media were put to use, because of the newsprint shortage.

Most newspapers and magazines continued, and the war gave additional interest to magazines of the picture type,

a trend which was also evident in the U.S.

The British government came to make wide use of newspapers, magazines, posters, billboards, films and radio in its efforts for recruiting, air raid precaution work, food conservation, war financing and maintaining morale. Government programs were handled through British advertising agencies.

Legislation.—The Miller-Tydings act was passed in the U.S. in 1937, providing that the federal anti-trust laws should not invalidate contracts between manufacturers and distributors fixing retail prices in states where such contracts were permitted by state fair-trade acts. Forty-two of the 48 states had passed fair-trade acts, permitting but not requiring manufacturers to fix minimum retail prices. By encouraging competition between national and private brands of merchandise, this legislation undoubtedly increased advertising for both types.

In 1938, the Wheeler-Lea act prohibited any advertising or merchandising practice unfair to a competitor, a consumer, or the general public. It was unnecessary under the act to prove that advertising had injured a competitor, but merely to show that it was misleading in a material respect. The Food, Drug, and Cosmetics act supplemented the Wheeler-Lea act by prohibiting misrepresentation of foods, drugs, and cosmetics, or the use of harmful ingredients.

British advertising was affected to some extent by war legislation. Producers of gasoline, tea and margarine were forced to pool their products, with the result that brand names could not be used, and advertising was therefore ineffective.

In the U.S., the first national labelling law was passed in 1940, calling for correct labelling of wool products.

Research.—Activities in advertising research carried on by specialized organizations, publications and advertisers in the United States increased throughout the decade 1937–46. A joint study was continued by the Bureau of Advertising of the American Newspaper Publishers association and the Advertising Research foundation to determine current newspaper reading habits. Qualitative measurements of the effect of radio programs upon audiences were improved, and figures on radio ownership, listening habits and location of receiving sets were made available to advertisers and their agencies.

An outstanding research project completed in 1941 was the four-year study of the economic effects of advertising under the direction of Neil Borden and an advisory committee of the Harvard graduate school of business administration.

During the ten years, the continuous measurement of readership of advertisements in magazines, known as the Advertising Readership service, conducted by Daniel Starch and staff, increased the number of magazines included in this survey from 18 to 31. In this continuing program, approximately 120,000 individual interviews were conducted each year.

A survey in 1943 by the Association of National Advertisers revealed that the public wanted modest, informational advertisements with a description of postwar products, data on war-winning projects and information on how to co-operate with them. The study also showed that persons were aware of the contribution business was making in the war effort and that they wanted companies to continue advertising because names should be kept in the public's mind. Forty-seven per cent believed advertised products were superior to those not advertised. Another study made among farmers showed that three-quarters of those questioned thought: (1) business advertising helped

them; (2) private management ran business better than government could; (3) government-owned plants should be sold to manufacturers after the war and not run in competition with business.

In 1944, looking forward to postwar problems, the Committee for Economic Development published two major research studies on problems of reconversion. And in order that government and business might have accurate facts on the nation's economic status to ensure transition to a high level of postwar production, congress approved an appropriation of \$9,672,000 for a fact-gathering program to provide data on manufacturing, distribution of employment, income and spending.

The Interstate United Newspapers, representatives of more than 100 publications in the Negro group, released preliminary data on a Negro consumer study made in Washington, D.C., covering information on owners and renters of homes, radio sets, insurance and on brand preferences.

In 1945 the Pacific Advertising association sponsored a program covering fundamental economic conditions which provided a postwar outlook for marketing and a background for market planning in the west.

Toward the end of the decade, increasing numbers of studies were made by research organizations, manufacturers, publishers and advertising agencies in the various fields of marketing and advertising. These studies included use of products in selected areas, and observation and reading of advertising. Although there was some criticism of research as being overdone and over-extended, this was more than offset by suggestions to the effect that increasing effort should be put to making proper and adequate use of the results of research.

Consumers.—In the United States, the National Retail Dry Goods association sponsored in 1937 the Consumer-Retailer Relations council, whose purpose was to encourage accurate, informative labels, uniform terminology meaning the same to dealer and consumer, and truthful local and national advertising. The group was composed of representatives of national women's organizations, large retailers, manufacturers and federal government bureaus.

A committee on consumer relations in advertising was established early in 1940 to engage in fact finding and research on the economics of advertising and consumption. Also early in that year the Institute of Standards, Inc., was founded as a co-operative solution to problems resulting from the consumer movement. This movement had grown to such proportions by then that no manufacturer could afford to ignore its influence. Consumer pressure caused greatly increased consumer activities among government agencies.

The year 1941 witnessed a widening interest on the part of consumers in their economic role as such. Heading their activities was consumer education, including choicemaking, market selection, use and care of products and emphasis on the relation of the consumer to the economic society. Numerous educational units were organized, including local consumer groups, co-operatives, community centres, and defense-inspired consumer councils. Emphasis was placed on conservation and reduction of waste. Consumers were educated to select essential goods, to have more concern for the use and care of appliances, to salvage used materials, to understand the importance of national resources, and so on. Demand for standards increased with the scarcity of goods. Consumers became less reformist toward business and more willing to co-operate with business groups, as witness the Committee on Consumer Relations in advertising and the National Consumer-Retailer council.

One answer to consumer complaints was the growth of informative labelling and advertising. The latter part of 1942 saw the beginning of experiments in self-selection of merchandise by the consumer in practically all types of department and speciality stores, with open displays accompanied by printed information.

As the war progressed, by 1943 for instance, copy for the woman consumer reached basic realism in the face of shortages. Food advertisements gave as much information about food nutrition as food editorials, and gave as well helpful information on how to make food go far, how to maintain family health, how to get variety out of stocks on grocers' shelves.

Shortages also affected the buying habits of consumers, and a survey showed that 58.8% of housewives went to more stores to obtain food products and 55.7% went to more stores to buy meat. Branded products became menaced by two factors; (1) unavailability of branded goods and the offering of substitutes; (2) compulsory grade labelling in fixing price ceilings. Brand Names Research foundation was established early in 1944 to educate persons on the basic idea behind trademarked products in the clothing and food fields.

A study by the Committee on Consumer Relations in advertising of the 14 most frequent copy themes showed highest approval by readers for copy that told them how to conserve and yet get the most out of one's equipment and clothing and how to stretch scarce foods and plan nutritious meals. Another study by this committee in 1945 showed that all media of advertising had materially increased their informational content to consumers on the proper use of products.

By unanimity reached among both canners and distributors on descriptive labelling techniques, additional product information was to be given on food labels.

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Aerial Photography

See PHOTOGRAPHY.

Aerodromes

See Airports and Flying Fields.

Aeronautics

See Aviation, Civil; Aviation, Military.

Aero-otitis and Aerosinusitis

See EAR, NOSE AND THROAT, DISEASES OF.

Aeroplanes

See Airports and Flying Fields; Aviation, Civil; Aviation, Military.

20 Afghanistan

An independent kingdom at the heart of Asia, Afghanistan lies between the U.S.S.R. in the N. and India in the S.E.; on the W., Afghanistan has a large common frontier with Iran (Persia) and on the E. a narrow one with China (Sinkiang, or Chinese Turkestan). Area: c. 270,000 sq.mi.; pop. (est. 1937) 9,910,000; (est. 1946) 12,-000,000. Chief towns (pop. est. 1946): Kabul (cap., 206,-200); Herat (75,600); Kandahar (77,200); Mazar (41,900); Maimanah (25,700); Baghlan (24,400). The government of Afghanistan is a constitutional monarchy; supreme legislative power is vested in the king, the assembly of nobles (Majlis-é-'alié-'Ayan) and the assembly of representatives (Shura-yé-Milli); the former are nominated for life by the king, the latter (100 in number) are nationally elected for a period of three years. At irregular intervals, to discuss important affairs of the state, the king summons the Afghan national assembly (Loya Jirga); its last meeting in the decade under review was in 1941, when c. 1,000 representatives were present. King: Mohammed Zahir Shah, who succeeded to the throne in 1933 after the assassination of his father, Mohammed Nadir Shah. Prime minister: Sardar Muhammad Hashim (1930-1946); Sardar Shah Mahmud (after May, 1946).

Recovery from Civil War.—In 1937, Afghanistan was still suffering from the calamitous effects of the civil war of 1929. The country's internal policy, therefore, was based on national reconstruction. In the first place, various efforts were made towards the establishment of security and national unity of all classes, in order that the country should be ready to receive the plans for fresh reconstruction which were envisaged.

The second stage was to reinforce the country's economic structure and to spread modern education. This was felt to be not only essential to Afghanistan's material and spiritual progress and advancement in the future, but also a dire necessity in compensation for past losses.

In the economic field, the Afghan government succeeded in 1939 in drawing up a comprehensive plan, a great part of which, however, could not be realized as a result of World War II. In 1945, this plan was resumed with the necessary modifications. The essential points of the plan were: (1) the restoration of Afghanistan's direct commercial relations with European and U.S. markets, (2) the stabilization of Afghanistan's currency and the protection of commerce and industry by the establishment of banks and trading companies; (3) the extension of agriculture with a view to increasing exports (especially cotton); (4) the creation of new industries so as to reduce imports.

Foreign Markets.—Before World War II Afghanistan traded with Persia, Russia and India and (via the last) with many European countries. In 1937 the Afghan minister for economic affairs visited Great Britain to examine the possibilities of extending trade with that country, but did not achieve complete success. During the war, for the first time, Afghanistan established trade relations with the U.S. via India. Before the war she traded unilaterally with Japan, importing only Japanese goods. She also traded with Great Britain on a small scale. As a result of the war, Afghanistan's karakul skin business, her only trading interest in London, was closed and transferred to the U.S. In 1936 a commercial agreement for three years, worth \$10,000,000, was signed by soviet and Afghan trade organizations; this connection was renewed in 1940 and again in 1942. Similarly, in 1936 a commercial agreement was signed between Afghanistan and Poland, which established good relationships between the two countries and resulted in the setting up of the first Polish consulate in Kabul.

In 1938, Afghanistan signed a trade agreement with Italy and in 1939 with Germany. In 1938 a conference of Afghan merchants and German representatives was held in Kabul, as a result of which the *Deutsche Lufthansa* became the only air line to use Kabul airport.

Subsequently, an Afghan-Japanese commercial society was founded and several Afghan students were sent to Japan to study economic problems. In March 1941 an Afghan mission went to Tokyo. In 1943 a commercial agreement was signed with the United Kingdom Commercial corporation.

Although World War II postponed a great part of the plan to strengthen Afghanistan's economic structure, yet the country was able to show a certain increase in exports.

Before 1936 a great part of Afghan trade was carried on by individual merchants, with the result that Afghan national interests were not always sufficiently defended. Consequently the government endeavoured to form trading companies. By 1940 there were 15 such companies with a total capital of \$29,953,000 (389,000,000 afghanis); by 1946 their total capital was \$74,425,000. (Afghani = 9.2 cents U.S.)

Foreign Policy.—The basis of Afghanistan's foreign policy during the period 1937–46 was the maintenance of friendly relations with her neighbours. Constantly observed by the latter, she strove continually to strengthen and reinforce these bonds and show herself desirous of extending her friendship to all nations. In accordance with such a policy and with her pacific intentions, Afghanistan declared her neutrality in World War II and remained faithful to this undertaking, not allowing the smallest occasion for injury to her political relations with friendly powers. In 1942, diplomatic relations with the U.S. were initiated and ministers exchanged. In 1944, diplomatic ties with China were strengthened, and an exchange of ministers between the two countries resulted.

On June 13, 1946, Afghanistan concluded its most important diplomatic agreement with the soviet union. It related to the definition and delineation of the frontiers between Afghanistan and the U.S.S.R., and was signed in Moscow by Vyacheslav Molotov and Sultan Ahmad Khan. the Afghan ambassador to Moscow. Under this agreement, the frontier line along the Penj and the Oxus rivers, where navigable, followed the deepest soundings; where not navigable, it followed the midstream. The attachment of the islands in these rivers, in accordance with international waterway practice, was to be dependent on the above methods of drawing the frontier line: the island of Darghah remained in the possession of Afghanistan, and the island of Aral Paighmar remained in the possession of the soviet union. By the agreement, the land frontier drawn in the 19th century was to be redefined, as in the course of time the boundary marks in many regions had disappeared and the frontier could no longer be clearly recognized. Article nine of the 1921 treaty between Afghanistan and the U.S.S.R., which envisaged a plebiscite among the former inhabitants of Panjdeh and of the border regions of the Turkmen republic (never subsequently carried out), was to be annulled. Article ten of the same treaty, which provided for the U.S.S.R. to make Afghanistan yearly payments of money as assistance during the early days of the latter country's independence, was also to be annulled (only one or two payments of this money were ever made).

Alghanistan—always a loyal member of the former League of Nations—applied for membership of the United Nations and was elected in 1946.

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Afghanistan: Statistical Data 1938

ltem	Value (000's omitted)	Amount or Number
	(000 s ollimed)	
Exchange rate		1 Afghani=5d. (9.2 cents U.S.)
Finance		
Government revenues	£2.842	
	(\$13.896)	
Government expenditures	£2,842	
•	(\$13.896)	
National debt	£175	
National debt		
	(\$856)	
Transportation	•• •	
Highways		4,000 mi.
		4,000 mi.
Exports—total	£2,634	•••
•	(\$12,880)	
Karakul skins		913.054
	•••	
Sheep and goat skins		855,646
Dried raisins and apricots		27.778 tons
Carpets	•••	108,747 sq.yd.
curpos	• • • •	

A.F. of L. (American Federation of Labor)

See Labour Unions; Societies and Associations; Strikes and Lock-outs.

Africa

See British East Africa; British South African Protectorates; British West Africa; French Colonial Empire; Italian Colonial Empire; Mandates; Portuguese Colonial Empire; South Africa, The Union of; Spanish Colonial Empire; etc.

Agagianian, Gregorio Pietro XV

Cardinal Agagianian (1895—), Armenian prelate, was born Sept. 15, 1895, at Akhaltsikh, in Caucasian Armenia. He studied and taught at the Congregation de Propaganda Fide in Rome and was ordained in 1917. Appointed in 1921 as vice-rector of the Armenian college at Rome, he was made rector in 1925, titular bishop of Comana in 1935 and patriarch of Cilicia in Armenia in 1937. Many members of the Roman Catholic clergy in the United States had studied under the patriarch at the Propaganda Fide, and he was a classmate of Cardinal Francis J. Spellman in Rome. Patriarch Gregorio was the highest dignitary among the 32 ecclesiasts that Pope Pius XII had proclaimed cardinals at the consistory in Rome, Feb. 18, 1946.

Agattu

See World War II.

Agricultural Adjustment Administration

See AGRICULTURE.

Agricultural and Industrial Chemistry, Bureau of

See AGRICULTURAL RESEARCH ADMINISTRATION.

Agricultural Machinery

See AGRICULTURE.

Agricultural Research Administration

Research seldom produces results overnight. Many of the achievements of the Agricultural Research administration of the U.S. Department of Agriculture that can be credited to the decade 1937–46 had their beginnings much earlier. It was so, for example, with hybrid corn, a major development of plant breeding.

Utilization of Hybrid Vigour.—The merits of hybrid corn had been proved by 1933, and in that year one out of every 1,000 ac. of corn in the U.S. was planted to hybrid varieties. In 1937, this acreage had expanded to 8% of the total, or 7,600,000 ac. By 1946, hybrids were planted on two-thirds of the corn land of the country, occupying 60,300,000 ac. In the corn belt, 99% of the corn was grown from hybrid seed. This change from open-pollinated corn meant an increase in yields averaging 25%.

Carrying the utilization of hybrid vigour further, plant scientists developed methods of producing hybrid onions and alfalfa. Both proved to be higher yielders than their open-pollinated parents. In livestock breeding, the hybrid principle was tried with swine, cattle and poultry.

In 1939, an experiment in crossing dairy breeds was begun to find out whether hybrid vigour and increased milk production would result. Stock of high quality and sires proved for their ability to transmit high milk-producing capacity to their female progeny were used. In almost every case the crossbred heifers were better producers than their dams. A striking characteristic was their persistency in milk production. The actual increase in production was 20% more than was expected on the basis of the records of their sires and dams. This could be the result of hybrid vigour.

New Plant Varieties.—New varieties of many crop plants were developed and released to farmers and growers with the co-operation of state agricultural experiment stations. Notable improvements were made in grains. About 51 improved varieties of wheat were distributed during the decade. The total production of wheat in the U.S. was estimated to be 550,000,000 to 600,000,000 bu. higher during the war years 1942–45 because of the development and distribution of varieties resistant to the major hazards of diseases, drought and insects.

A good example of improvement in wheat was Cadet, in the group of hard red spring wheats. Released by the U.S. department of agriculture and the North Dakota Agricultural Experiment station in 1946, Cadet promised to excel older wheats in yield and in milling and baking properties. Its release followed a decade of behind-thescenes breeding and testing work, which began with crossing the Merit and Thatcher varieties. It was increased and tested at 24 agricultural experiment stations in eight states and was found to be consistently high yielding, resistant to stem and leaf rusts and early maturing.

It was partly because of the increased yield per acre of new resistant wheats and of hybrid corn that the U.S. was able to produce during World War II nearly 50% more food than in World War I with 4,000,000 fewer men on the farms.

Oats was another cereal improved by plant breeding. Improvement of oats enhanced the value of this crop as a livestock feed at a time when a substitute for wheat and barley was needed. Among the new varieties were Clinton and Benton, released in 1945 by the department and the Iowa; Illinois and Indiana experiment stations. They had the advantages of higher yields, stiffer straw and greater weight per bushel than most other varieties, besides being

¹The administration in 1946 comprised seven research agencies—the bureaus of agricultural and industrial chemistry, animal industry, dairy industry, entomology and plant quarantine, human nutrition and home economics, and plant industry, soils, and agricultural engineering and the office of experiment stations.

rust and smut resistant.

Control of Livestock Diseases and Parasites.—The end of a long road was virtually reached in 1939 when cattle-fever ticks, carriers of tick fever of cattle, were 99% eradicated in the U.S. This meant the practical elimination of a livestock disease that formerly took a toll estimated at \$40,000,000 a year. Many cattle died of the fever; survivors were poor producers whose value was greatly reduced. Research determined that the disease was carried by the cattle-fever tick, and a campaign was begun to control the disease by eradicating the insect. To eliminate the myriads of ticks in 15 southern states seemed a fantastic attempt. But the job was done through the use of dips, sprays and livestock management methods.

Internal parasites continued to present a problem in the raising of all types of livestock. Drugs for their removal were specific—a different drug for each kind of animal and each type of parasite. In 1938, a department scientist found that a single drug—phenothiazine, a coal-tar chemical—was effective against a number of parasites and could safely be given to cattle, sheep, swine, horses and even poultry. Within five years of this discovery phenothiazine was more widely used than any other drug for freeing animals of parasites. In 1943, about 3,000,000 lb. of phenothiazine were produced and used for this purpose in the U.S.

Other control programs made strides toward completion during the decade. Bovine tuberculosis reached the clean-up stage with less than one-half of 1% of the cattle in every county of the U.S. and in Puerto Rico reacting to tests with tuberculin. The last county was added to this list in 1940.

Also in 1940, as a control measure for brucellosis, or Bang's disease of cattle, vaccination of calves five to eight months old was officially adopted as a control measure. The vaccine used, known as strain 19, was developed by the department, which controlled its manufacture. A new type of vaccine for official use in the campaign for the prevention of hog cholera was patented by the bureau of animal industry in 1945.

Dairy Herd and Poultry Improvement.—The decade 1937–46 saw the growth of two projects that brought about steady improvement in their fields. These were the National Poultry Improvement plan and the annual List of Sires Proved in Dairy Herd Improvement associations.

The poultry improvement plan was developed to aid the poultry industry through improving the efficiency of production of eggs and poultry meat and reducing losses of chicks from pullorum disease. The plan was administered co-operatively by the bureau of animal industry and a state agency in each of the 47 states co-operating. Results both of scientific research and of practical experience were made available to participating hatcherymen, breeders and flock owners. The department issued a yearly directory of chickens owned by participants in the plan, giving their production and breeding records. Official terminology was established for the identification of approved breeding stock, hatching eggs and chicks. During the first ten years of its operation, the plan contributed to an increase of about 20 eggs in the average production per hen in the U.S. More than half the breeding birds in the country were included.

In 1937, the first annual list of "proved" dairy sires was published by the bureau of dairy industry. This marked the beginning of a nation-wide program to improve the production of dairy herds through breeding. Proof of a dairy bull's breeding value was obtained by

comparing the milk-production records of at least five of his daughters with those of their dams. The list included all records, good and bad, and enabled dairymen to select sires whose daughters had been consistently high in milk and butterfat production when breeding to improve their herds.

New Insecticides.—World War II had a marked influence on insecticides. First, it cut off from the U.S. many important insecticidal substances formerly imported. Next, the U.S. armed forces issued an urgent call to the bureau of entomology and plant quarantine for materials and methods to control disease-carrying and other insects in the war areas. One of the bureau's laboratories, at Orlando, Fla., tested some 8,000 materials as insecticides and 7,000 as insect repellents. It was there, in 1942, that a compound undergoing routine test proved to be more deadly to more insects than any other known, old or new. This was DDT.

Halting a typhus epidemic in Naples, Italy, by exterminating typhus-carrying lice with DDT powder was a noteworthy accomplishment during the Allied invasion of Italy. DDT was also an important factor in the war in the Pacific, especially through its effectiveness in killing malaria-carrying mosquitoes.

The many important peacetime uses of DDT were still being explored. Experiments with its use on cattle and in barns to control flies resulted in unexpectedly large increases in production of both meat and milk. Its use to control many crop pests was limited by possibility of damage to beneficial insects, especially bees, and of injury to animals and men from eating treated plants or their products.

Methods of dispersing insecticides were also greatly improved during the years 1942–46. The "aerosol bomb" was invented by scientists of the department for use in enclosed spaces, such as rooms, tents or aeroplanes. This dispenser consisted of a metal container filled with an insecticide dissolved in a liquefied gas under pressure. Freon 12, a commonly used refrigerant, was excellent for this purpose. Opening a valve with the finger released the gas, which turned to vapour as it hit the air, carrying the particles of insecticide to all parts of the enclosed space and killing all insects present. More than 16,000,000 of these bombs were distributed to the armed forces.

The aerosol principle was adapted to large-scale outdoor use on field crops. Released under a large hood from a high-pressure container, the aerosol, containing various insecticidal formulations, killed most of the insects on the plants as the apparatus was pulled through the field.

More effective insecticides and better equipment for their application made possible a broader and more effective large-scale attack on certain insect pests. Tests with DDT applied over forest areas by means of aeroplanes or ground equipment again demonstrated the effectiveness of this insecticide in the control of the gypsy moth. The new method required much less labour and covered far more territory than the methods and materials used previously. With these improvements in methods and materials, the possibility of controlling the gypsy moth appeared bright.

A "mist blower," which dispersed an insecticide in finely atomized form for treating shade and orchard trees, was as effective and much more economical than the older type using a dilute spray. Twelve gallons of spray material went as far in the mist blower as several hundred gallons in the old type. (See also Entomology.)

Regional Chemistry Laboratories.—The congress of the United States in 1938 authorized the establishment of a laboratory in each of the four major farm producing regions of the country. These laboratories were created

to develop new and wider industrial outlets for farm products. Work was under way in all of them by 1941.

The method by which penicillin production was increased in time for the life-saving drug to be available to save the lives of thousands of war wounded was perfected by scientists of the Northern laboratory, at Peoria, Ill., in 1941-42. Penicillin, discovered by Dr. Alexander Fleming in England, could not be produced there under war conditions in large enough quantities to supply even a small fraction of the need. The problem was taken by British scientists to the Northern laboratory because of the latter's outstanding collection of micro-organisms, including moulds such as that which produces penicillin. Laboratory scientists found a culture medium on which the mould produced many times larger quantities of the drug, and they also discovered improved strains of the organism. Large-scale commercial production of penicillin was made possible as the result of this work.

The U.S. navy needed a material for cleaning the engines of naval aircraft to replace hominy grits, which was needed as a food. The Northern laboratory scientists found that ground corncobs and rice hulls—both waste products—used in sandblasting equipment, made a good substitute.

At New Orleans, La., the Southern laboratory, seeking to find or maintain markets for cotton, improved the wearing quality of cotton tire cords through use of selected varieties of cotton. Light truck tires made with the improved cord, in rigid army tests, gave 250% more mileage than tires made from regular commercial cord. Southern laboratory engineers also designed a machine which cut cotton lint so it could be substituted for cotton linters in the manufacture of smokeless powder.

To establish a domestic source of root starch for industrial purposes to take the place of imported starches, department chemists conducted intensive experiments for more than ten years on the production of starch from sweet potatoes. Their success was attested by the building, in 1945, of a modern, \$7,000,000 commercial plant in Florida to manufacture starch from sweet potatoes and other root crops.

Scientists of the Eastern Regional Research laboratory at Wyndmoor, Pa., learned how to make from cull apples a bland syrup that had several commercial applications. They also developed a method for capturing the delightful flavour, or essence of fresh apple cider.

In studying the constituents of tobacco, research workers at the Eastern laboratory found that the leaves of the flue-cured type contained small quantities of a compound called rutin. It was thought that, because of its chemical composition, rutin might have therapeutic value. In co-operation with the University of Pennsylvania medical school, the laboratory showed that rutin was beneficial in treating capillary fragility, a condition frequently associated with high blood pressure. Having found a use for rutin, the investigators sought other sources that would give higher and more economical yields. Buckwheat leaves and blossoms from young plants were found to contain many times as much as tobacco. Commercial production of rutin from buckwheat was begun in 1946.

At the Western laboratory, Albany, Calif., methods of dehydrating and compressing foods for the armed forces in the field were studied in laboratory and pilot plant. Improved methods developed there were adopted by the dehydration industry. Freezing preservation of fruits and vegetables was also a major project. In connection with this study, a product named "Velva Fruit," was made from fruits too ripe for shipment. The ripe fruit could be crushed and frozen immediately and kept until it could

be made into Velva Fruit in commercial ice-cream plants or with home equipment. The final product was of ice-cream consistency, but it contained no cream—just the fruit, a little gelatin and sugar. (See CHEMURGY.)

Diet Studies.—A pamphlet entitled "Are We Well Fed?," issued in 1941, summarized the results of a study of family food consumption in the U.S. made by the bureau of home economics (renamed, in 1941, the bureau of human nutrition and home economics) and co-operating government agencies. These reports gave a comprehensive picture of the diets and spending habits of farm, village and city families of all income levels over the United States. The startling conclusion drawn from the data and reported in the pamphlet was that one-third of the families were ill-fed according to standards of adequate nutrition. Substandard diets were usually, though not always, the result of low income. Another third or more had fair diets—barely adequate nutritionally. Only a fourth had diets that could be rated good.

Sizing Children's Clothing.—Because the traditional method of sizing children's clothing by age had serious shortcomings that caused nation-wide waste in misfits and returned goods, a study of children's body measurements was undertaken in 1937 by the bureau of home economics in co-operation with the Works Progress administration and 19 colleges, universities and other institutions. Trained workers made detailed measurements of 147,088 boys and girls ranging in age from 4 to 17 years. From the data obtained, a new system was developed for sizing children's garments, based on height and weight. Many manufacturers of children's clothing and the larger pattern companies in the United States adopted the new system of sizing. (P. V. C.)

Agriculture

The decade 1937-46 was the period of the greatest growth in productivity in the history of U.S. agriculture. It was a period in which a series of eight years of favourable weather came together with a supreme effort to increase production on the part of farmers. It also marked the coming into practical use of many of the results of scientific research of the previous half century and also the widespread use of new mechanical power machinery. The outstanding fact was that this greatly increased output was accomplished without much total expansion of area; by a declining number of farm operators and labourers. The expansion, particularly during the war years, was accomplished by a shrinking farm population under severe handicaps and shortages with very little price stimulus. The age of farm workers averaged higher than ever before and a much larger part of the work was performed by women and children than in the past. The application of newer technical knowledge was more universal than in any previous crisis. The expanded research and educational agencies, such as the staffs of the agricultural extension service, the Agricultural Adjustment administration and the Soil Conservation agency provided an army for assistance and control. While a large measure of regimentation created considerable complaint at times, the general result was good for the great majority of rural people. Gross agricultural income reached new heights and was widely distributed. The farm mortgage debt was greatly reduced. The majority of agricultural people found themselves at the end of World War II with greatly expanded resources in the form of bank deposits and bonds but with somewhat depleted farm equipment and a lack



Contour plowing on a mechanized farm in Texas

of building repairs. Land values rose at a rate comparable to the boom in World War I, but the prospect of a sustained demand for farm products was an element of security, if adjustments to postwar needs could be made gradually. Congress assured farmers that prices would be maintained at near parity levels for two years after the official end of the war. This would allow two seasons for farmers to adjust their production to reduced demand.

An analysis of U.S. agriculture as an industry, based upon surveys by the United States department of agriculture, showed the composition and character of the enterprises which made up the whole. The family farm had been the typical farm unit since the continent was first colonized. The total number of farms declined from 6,448,000 in 1910 to 6,096,000 in 1940. At the same time, farm population shrank from 32,077,000 to 30,269,000 in 1940. The number in the farm labour force reached its peak of 11,600,000 about 1910, and declined to 9,162,000 in 1940. While farm population was declining slowly, the nation's total population had expanded from about 92,-000,000 in 1910 to 131,000,000 in 1940. The percentage of farm population shrank from more than one-third to less than one-fifth of the total. This decline in the number of farm people was accelerated by World War II as millions left farms to work in war industries and other millions joined the U.S. military forces. How this shrinking farm labour force could have produced a surplus for a growing population of consumers before the war could only be explained by the steadily increasing productivity per worker caused by technical and mechanical advances. Between 1930 and 1940, the census showed a gain of only 7% in total population while agricultural production gained 12%; at the same time productivity per farm worker increased 28%.

Changes in farming modified the character of the several groups making up the 6,000,000 farms. They were no longer mostly of the family-supporting type of 1900. On the contrary, the productive farms were better and others poorer. The surplus production was coming more and more from the more efficient commercial farms located in the more productive areas. The large farms on the better soils had become better able to utilize the new results of scientific research and power machinery which had produced the great increase in production during the decade

1937–46. A large proportion of the nation's farms had become too small to be efficient as surplus producers. The census returns showed some startling facts.

Of the total number of 6,097,000 farms in 1940, 1,240,000 produced less than \$750 worth of products and had no power in animals or tractors. They averaged only \$250 output per farm and only 3.2% of the total national output. The remaining 4,857,000 farms constituted the real farm productive plant. These could be divided into three groups: (1) large, 91,000 (those with more than \$10,000 worth of products) that produced 19.2% of the total national output; (2) adequate family-sized farms, 1,584,000 (producing \$1,500 to \$10,000 worth of products) that returned 41.1% of the grand total; and (3) inadequate farms, 3,182,000 which produced from \$750 to \$1,500 worth of products amounting to 28.5% of the national total.

This analysis showed that less than one-third of the farms produced more than two-thirds of the farm output. Viewed from the standpoint of national food supply, one-third of the farms were of minor importance. Many of them could be abandoned without loss to the national economy. Their value as homes, providing more or less subsistence, was another matter.

During the decade 1937–46, nonfarm employment brought extra income to these less efficient farmers and enabled some of them to enlarge their land areas and become more efficient farmers. The government aid to tenants to buy farms was a factor in this change. The greatly increased net income of agriculture as a whole tended to advance a readjustment in the way of better farms becoming larger by absorbing less efficient small units. The 91,000 large farms averaged 2,857 ac. each, the 1,584,000 adequate family farms 253 ac., while the 4,422,000 inadequate averaged only 160 ac. each. The average size of all farms in 1940 was 174 ac.

The decade 1937-46 was generally recognized as a turning point in U.S. agricultural history because of the fact that production during the war years 1941 to 1945 reached new high records. It was seen as a demonstration of the value of technological progress designed to increase farm production. As recently as 1922 alarms had been sounded on the danger of declining food production in the face of increasing population. The latter was at the rate of 15% from 1910 to 1920 but dropped to 7% in the 1930-40 dec-

ade. Agricultural exports declined from 1920 to 1940 and increased only as supplies for lend-lease and relief were provided by government purchases after 1940. A new period of agricultural surplus production was anticipated by many agricultural authorities after the relief needs had been supplied and foreign countries had restored production. The problem then to be faced would be that of aiding the lower third of the farms to produce a more adequate income. To this end the location of small industries in crowded agricultural areas was revived, so as to provide part-time, nonagricultural employment for farm people. The increase of industrialization was generally expected, although a vigorous back-to-the-land agitation was revived in some quarters, as it had been after World War I.

U.S. Crop Production.—The outstanding fact of U.S. agricultural history during the decade 1937–46 was the remarkable crop production attained. Not only was the total imposing; the breadth of the increase, spreading over the great majority of crops and livestock, was unprecedented. Only a very few crops failed to set new records during the decade, and many of the new high records were far above what most optimistic forecasters had considered possible.

Estimates of gross farm production by the United States department of agriculture placed the high record of 1944 at 18% above 1939-a gain of 3.6% a year. During the 20 years before 1939 the gain had been only 9%, or less than ½% a year. The 9% expansion between the two world wars was sufficient to meet all needs and pile up some surpluses. United States farms could have produced more had there been a demand for the product. War was the stimulant to bring out the real productive capacity of the farm plants. It is noteworthy that this greater production was made with small expansion of acreage and with a declining supply of labour and materials of production. The increase of 29% from the end of World War I to 1944 was made on only 5% more cropland. One factor was the shift of about 50,000,000 ac. from the production of horse and mule feed as mechanical power increased. The production of feed for work animals made up 22% of all farm production in 1919, 11% in 1939 and only 8% in 1944.

The shift from animal to mechanical power was the most important single factor, aside from favourable weather, in the great increase of production during the decade 1937–46. Just before 1937, the nation experienced the two most serious drought years, 1934 and 1936, in its agricultural history. In contrast, the ten years 1937–46 saw probably the longest succession of favourable seasons in U.S. history. All regions participated in the increased productions. The west north central region, the worst sufferer in 1934 and 1936, made the greatest gains, followed by the mountain and Pacific regions.

Measured as farm output (gross production less that part used for farm-produced power in the form of feed used for work animals), the increase was faster than in gross farm output. The output of the west north central states—Minnesota, Iowa, Missouri, the Dakotas, Nebraska and Kansas—increased more than 60% by 1944 over the prewar 1935–39 average. This was the area in which the machine had replaced the horse to the largest extent. Farm-produced power was only 7% of gross farm production compared with 16% in the east south central states where the horse and mule were still used to a large extent. Compared with the average of 1923–32, preceding the drought years, the 53 crops produced 111.5% in 1917, 123.9% in 1942 and about 121.2% in 1945. The gains

from 1937 to 1945 of 22 field crops were from 199.5% of the pre-drought years in 1937 to a top of 121.3% in 1942. Thirteen fruits increased from 125% to 142% in 1944, 8 vegetables for processing from 146% to 215%, and 17 market vegetables from 128% to 168.9%.

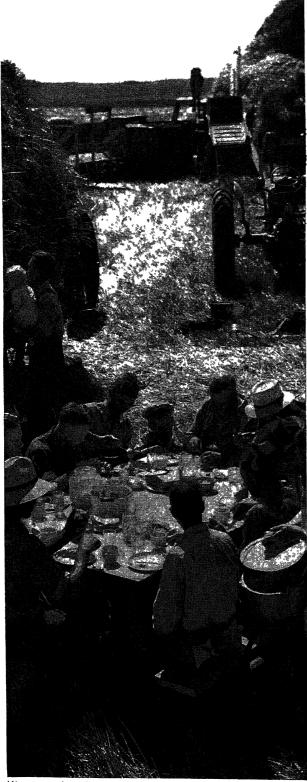
The smaller losses of crops planted but not harvested after 1937 also constituted a favourable factor. From 1937 to 1945 it ranged from 24,570,000 ac. in 1937 to only 10,058,000 ac. in 1945 and averaged 15,000,000 ac. In the preceding eight years the annual losses exceeded 42,000,000 ac. three times and averaged 25,000,000 ac. These losses were chiefly in the small grains, winter wheat and oats.

Of the 53 crops reported and estimated by the United States department of agriculture, more than 40 made high production records during the decade, and most of them during the war years 1941-45. Some of these records were due to stimulated expansion, wheat for example, but others were the result of plantings that had been made in earlier years just coming into the bearing age, as in the case of grapefruit. Of the major grain crops, the record productions of corn, wheat, oats, barley and rice were outstanding. Rye and buckwheat were conspicuous examples of subnormal yields. Potatoes and almost all vegetables made records. Tobacco and peanuts made bumper crops, and all fruits were abundant. Only cotton, of the major crops, declined to a new low in production. Hay and the newer feed crops, soybean, lespedeza and sorghum, returned new high totals.

The bountiful yields of most crops from 1937 to 1946 were the result of the favourable seasons, improved culture, better seed and the use of more machinery. The trend of the combined yield of all crops had been downward for the decade before 1937, because of the bad years 1934 and 1936, and were below the pre-drought average 1923-32. In 1937, yields were above the average of the previous two decades and continued to gain until 1945. In terms of the pre-drought base index as 100, the record was: 1937 118%, 1942 136.2% and 1945 130.2%. The greatest gains were in the west north central and mountain areas. In general, yields increased on the better lands, and the poorer lands were turned to noncrop uses. The most important high yield record made during the decade were those of cotton, 293.5 lb. per ac. in 1944; tobacco, 1,117 lb. per ac. in 1944; corn, 35.2 bu. per ac. in 1942; potatoes, 150.6 bu. per ac. in 1945 and wheat, 19.8 bu. per ac. in 1942. These national averages were less impressive than the records made by some leading states in the production of each crop.

The area of U.S. agriculture as expressed in terms of cropland was estimated at about 424,000,000 ac. during the war years, compared with 426,000,000 ac. in the prewar period. Estimates by the United States department of agriculture covering 52 crops harvested were 338,400,000 ac. in 1937, a decline to 321,700,000 ac. in 1939 followed by expansion to 350,900,000 ac. in 1944 and 346,900,000 ac. in 1945. The cultivated area on U.S. farms had changed relatively little since 1919 as a whole, although there were changes by regions. These regional shifts had taken place mostly before 1937—from 1919 to 1929. There was a decline of acreage in the New England, middle Atlantic, south Atlantic and east north central states which was offset by increases in the mountain, Pacific and west south central regions.

The changes in acreage of principal crops in the decade 1937–46 were more significant than total changes. Most striking was the decline in cotton from 33,623,000 ac. in



Minnesota wheat harvesters at lunch in the summer of 1943. U.S. farmers worked long hours during the war years to supply the unprecedented food needs of the U.S. and its allies

1917 to 17,688,000 ac. in 1945 and 18,316,000 ac. in 1946. Notable increases were rice, 1,099,000 ac. to 1,506,000 ac.; soybeans, 2,586,000 ac. to 10,873,000 ac., and peanuts, 1,538,000 ac. to 3,183,000 ac.

Wheat production was high in 1938 and continued so

until 1944, when a record crop was produced. The United States entered World War II with large stocks of wheat which reached the huge total of 632,000,000 bu. in 1942equal to many whole crops of preceding years. Food and industrial uses expanded in 1942 and 1943, bringing the total supply down gradually. By 1946, stocks were so reduced that for a few months early in that year shipments for relief purposes were short, and special price inducements were used to stimulate deliveries of wheat from farms and to move stocks held in elevators. The whole record for wheat during the decade was one of abundance, which at any other time would have been a serious surplus. The big crop of 1946 assured an ample supply for the next year notwithstanding the heavy demands for relief shipments. This huge wheat production during the war was accomplished with an average price much below the level of World War I-about \$1.50 per bu. compared with a fixed price of \$2.10 per bu. in 1917-19.

The corn crop was even more remarkable than wheat during the decade. The average of the ten crops 1937-46 was 2,863,000,000 bu. with no crop below the 2,000,000,000 total, and 5 over 3,000,000,000. Up to 1937, only two 3,000,000,000 bu. crops had been produced, and a running average of about 2,500,000,000 bu. was regarded as the maximum that could be produced aside from a few exceptional years. But these exceptional years came in 1942 and continued to the end of the decade. This abundant feed supply was largely responsible, together with good hay and pasture, in supporting the large livestock production of World War II. The large corn crops were produced on an acreage smaller than the average of the previous decade, but with record average yields. Improvement of seed corn, widespread use of hybrid seed and expanded mechanization were the causes of the increased output.

The minor grain crops—oats, barley and rice—each made large crops during the decade. Nine of the ten oat crops were over the 1,000,000,000 bu. level, and those of 1945 and 1946 were about 1,500,000,000 bu. each. Barley was less important, yet made a crop in 1942 almost one-third larger than any crop before 1937. Rice increased steadily during the decade from around 52,000,000 bu. to 70,000,000 bu., thus assuring an ample domestic supply and a surplus for export. Rye was the only grain crop that did not make new record production during the decade. The relatively new crop, sorghum, expanded rapidly and contributed largely to the feed supply. The eight principal grains increased from an average of about 110,000,000 tons in 1937 to an average of about 135,000,000 tons per year in 1945.

The tame and wild hay crops of the decade increased steadily, supplemented by a large increase in sorghum grown for forage and silage which more than doubled in output. Of the oil-bearing crops, principally soybeans, the increases were most substantial. Peanut production almost doubled, and dry beans also made new high record output. Potato output was maintained at the maximum of the previous decade and with a record yield turned out three crops of over 425,000,000 bu. Flaxseed and all of the hay and clover seed crops reached high peaks-about double the average of the decade before 1937. Tobacco was an outstanding crop through most of the decade, exceeding 2,000,000,000 lb. for the first time in 1946. Cotton was the only major crop to shrink steadily during the period, from nearly 19,000,000 bales in 1937 to a low of 9,195,000 bales in 1945, and 9,290,000 bales in 1946.

The expansion of fruits and vegetables proceeded steadily. The orange and grapefruit crops increased more than 50%, particularly the latter. Apple production suffered

two very disastrous years, 1943 and 1945, but did better than in the previous decade. The 15 principal fruits as a whole returned crops that averaged about 20% above the output of the decade before 1937. Vegetables for fresh market and processing increased about 50%.

After the very productive years 1942 to 1945, the end of major hostilities was expected to be followed by a drop in agricultural output. But the record of 1946 was on the same high scale as that of the previous five years. The wheat crop (August estimate) was 1,132,000,000 bu., an alltime high record; corn, 3,487,000,000 bu., also a record; oats, 1,498,000,000 bu., a third grain record. Other top production crops were tobacco, peanuts, soybeans, potatoes, sugar beets, peaches, pears, grapes and rice. Pastures and feed grains in addition to corn provided abundant feed for livestock of all classes. The labour problem on farms was partially solved by returning service men, but there were still shortages of machinery and supplies.

Livestock Production.—In the decade 1937-46, U.S. livestock production reached a peak in 1944 and then declined. The cycle of livestock expansion and decline coincided with the good years for pastures, hay and grains, with the result that the output of meats was at a high level at the time of greatest need during World War II. The numbers of cattle, milk cows, hogs and poultry all increased after 1937 until 1944. Sheep numbers increased until 1942, then began to decline. Horses and mules continued the decline that began with the introduction of the tractor and reached new low numbers, about half the number on farms in 1918. The pig crop increased with the growing supply of corn and with the strong war demand, from about 61,000,-000 head in 1937 to the record of 121,696,000 head in 1943. Per capita meat production averaged 125 lb. in the prewar period 1935-39 and rose to 177 lb. in 1944. While meat production as a whole increased more than 40% during the war, military and lend-lease demands were so large that the civilian supply increased only 20%. High consumer purchasing power absorbed the increased production so rapidly as to create shortages in some localities. The meat demand exceeded the greatly enlarged supply.

Dairy production started a cycle of increase in 1937, after the drought years 1934 and 1936. The number of cows increased steadily to 1945. Large crops of feed grains, hay and lush pastures favoured milk production, which was increased further by better feeding and care. Milk production grew steadily, from about 103,000,000,000 lb. in 1937 to the record of more than 123,066,000,000 lb. in 1945. Butter production declined over 30% during the decade because of the strong demand for fluid milk and the diversion of milk from butter to cheese by the government. Per capita butter consumption declined from 16 lb. in 1937 to an average of only 11 lb. in 1945. Severe rationing did not save enough butter to meet the war needs. While the government reserved 30% of all the butter produced in 1943-44, civilian stocks shrank seriously, causing the government to cease buying for several months in late 1943 and early 1944. Cheese production was increased to supply military and lend-lease requirements, the output about doubling in the decade.

Poultry raising responded to the war need quickly and grew from a low level in 1937 to the record production year 1943, when 934,000,000 birds were raised. Egg production followed a similar line and advanced year by year from 37,564,000,000 in 1937 to the peak of 57,874,000,000 in 1944. This record was followed by a slight decline in 1945–46. The rate of production per hen rose from an average of 130 eggs per year in 1937 to 152 eggs in 1945. Outstanding changes in the poultry industry were the

growth of the specialized broiler business and better breeding and feeding of laying flocks. Turkey raising grew steadily after 1937 and provided about 4.6 lb. per capita compared with 25.3 lb. of chicken meat. Turkey raising became a large-scale specialized business, with the average of commercial flocks numbering thousands of birds. Egg consumption by civilians increased from 306 eggs per capita in 1937 to about 390 eggs in 1946. The military and lendlease demand was large, the egg-drying industry using the large part of the output for shipment overseas.

Of agriculture's production food remained the largest part, although the production of fibres, oils, etc., used in industry rose to about a third of the total. Feeds turned into meats, dairy products, eggs, etc., cannot be measured as food. Estimates by the United States department of agriculture gave the food production of the base period 1935-39 as 100. For that period, 93.7% of U.S. national food supply was produced within the country and 6.4% was imported. Domestic production increased steadily to 125% by 1942, 138% by 1944 and 136% by 1946. Imports continued to be about 6.5% through the decade. The increase in the volume of food production during the 6 years 1939-46 was almost as large as the increase for the 30 years from 1909 to 1939.

The distribution of the national food supply in the prewar period was 97.4% to consumers and 2.6% for exports; net imports were about 4%. By 1941, the military and lend-lease needs began to take 2.4% and 2.6% respectively. The military takings increased to 8.1% in 1942, 15.2% in 1943, 17.4% in 1944 and 17.1% in 1945, after which they dropped to 3.7% in 1946. Lend-lease takings increased to 6.5% in 1942, 9.3% in 1943 and 8.8% in 1944. The 6.8% taken in 1945 and 7.8% in 1946 was chiefly for relief. At no time were the shipments for lend-lease as large as the military requirements except in the case of some particular foods at certain periods. Government stocks were being built up in 1942 and 1943. By late 1945 these military and government stocks were released as the forces were demobilized, and civilian supplies were increased.

Total food supplies were about 38% above prewar, and even with the large amounts going to the military forces, etc., civilians increased their rate of food consumption. Estimated per capita food consumption, with 100 equal to the prewar base, was 104 in 1941 and 1942, 105 in 1943, 109 in 1944 and 110 in 1945. Full employment at high wages led the workers to demand the best food available in as large amounts as rationing would permit. Total food production was not equal to the full demand. It was estimated that 7% to 10% more would have been needed to meet total demands. In other words, rationing probably saved that amount. The years of greatest shortage were the years of the highest United States production, mid-1944 to mid-1945, the final effort of the war in Europe.

The supply of meat was sufficient to enable civilian consumers to increase the average per capita consumption of meat from 125 lb. in 1935–39 to 149 lb. in 1944. The principal increase was in pork, from an average of 56 lb. in 1935–39 to 76 lb. in 1944. Beef consumption increased from a prewar average of 54 lb. to 61 lb. in 1942 and then dropped to 54 lb. in 1945. The demand for meat was so strong in 1944 that consumption might have reached 170 lb. had supplies been available. Meats became scarce early in 1945 because military requirements took 20% of the total supply and production of pork was declining.

Per capita consumption was estimated at 137.7 lb. compared with 125.6 lb. average 1935-39. Consumption in

1946 was estimated in September by the United States department of agriculture at about 143 lb. per capita. Meat production during the first half of 1946 was about the same as in the first half of 1945. Exports were increased in the spring and civilian supplies became scarce in May and June when livestock was held on farms in view of the possible end of price control. The lapse of price controls in July led to large marketings. When price ceilings were restored, heavy marketing ceased and supplies became very scarce. Meat production in September was the lowest in years; with final removal of price controls in October, however, supplies again became plentiful. The number of cattle on feed in the corn belt was $45^{\circ\prime}_{10}$ below the number a year earlier on Aug. 1. Prices of all meat animals reached record high levels during the non-price-control period in July and August, and again after Oct. 1946.

Agricultural Policies and Controls.-The Agricultural Adjustment administration in 1937 was operating on a program of agricultural conservation rather than one of production control. Goals were set up for soil-depleting crops for states, counties and farms. In the case of some crops, referenda of growers were held to determine whether a majority of growers desired to participate in the plan. Maximum payments were calculated for each farm. Full payment was made only if the soil-depleting acreage did not exceed the goal and if there was sufficient acreage of soil-conserving crops. The national goal of 305,000,000 ac. of soil-depleting crops was divided into county and farm goals by state and county committees. For 1938 this goal was reduced to a national total of about 275,000,000 ac., reflecting the fear that large production would result in burdensome surpluses. The objective of the farm program after 1932 was to restrict production and thereby raise prices of farm products. While the policy had changed to that of conservation, stimulated by payments to farmers, the idea of restricting total production of some crops was a secondary object in 1937 and 1938. The need for increasing production for war purposes had not yet been recognized; the threat of war was not evident to most Americans in 1938. Even at the end of 1939 the probable effects of the war in Europe were not realized. The secretary of agriculture, in his report for 1939, said: "It would, of course, be folly to regard the new war as in any way a solution of our farm problem" and urged that the plans of 1937 and 1938 be continued. As subsequent developments showed, the war almost completely changed the situation. Restrictions on production gave way to stimulation; soil conservation was continued to some extent, but fertility was expended rapidly by the heavy cropping. Price controls were shifted to a policy of holding prices in check rather than raising them.

The organization that had been developed to control agriculture was quickly turned into an agency to stimulate production as soon as the need became evident in 1940. By 1940, each of the 3,022 agricultural counties in the United States had an AAA committee. About 135,000 farmers were enlisted as county committeemen to be local leaders in operating government agricultural campaigns. About 6,000,000 farmers were co-operating in some manner, and AAA was practically universal.

Government payments to farmers were about \$367,000,000 in 1937, increasing to \$482,000,000 in 1938 and to \$807,000,000 in 1939. The total cost of the AAA program in 1940 was reported as \$908,000,000, divided as follows: soil conservation, \$518,000,000; parity payments, \$215,000,000; purchases of agricultural commodities by the govern-

ment, \$67,000,000; Sugar act payments, \$47,000,000; expenses of administration, \$61,000,000. The division of these payments was: to cotton growers, \$215,000,000; corn, \$150,000,000; wheat, \$138,000,000; sugar, \$47,000,000; other crops, \$20,000,000; ranges, \$14,000,000 and general, \$172,000,000. Government payments direct to farmers were reported for 1941 to 1945 as follows: 1941, \$586,000,000; 1942, \$691,000,000; 1943, \$672,000,000; 1944, \$804,000,000 and 1945, \$750,000,000.

By the end of 1940 the "National Defense" campaign had begun, but the government was not yet aroused to the prospect of war. It was not expected that United States production would have to be increased materially. The alarm was over the loss of U.S. export trade. It was believed that the loss of this trade and the surpluses on hand would meet all requirements. The idea was still held that, because of the loss of the foreign markets and the large stocks, production restriction should be continued. The "ever-normal-granary" program which had come into full operation in 1939 was pointed out as a useful defense measure.

The farm markets were unsettled through 1939 and 1940. Sugar was at a premium, but the government authorities did not anticipate a shortage because the United States and its possessions produced 80% of domestic requirements. The loss of the Philippines was not foreseen. General farm markets were weak through 1938–39 and into 1940. Grain exchanges pegged prices at the request of the government in mid-1940. Yet at the end of 1940 the idea was held by the secretary of agriculture that farmers should be aided to get more nonfarm income. The shadow of surpluses was still depressing prices.

The value of the AAA program to agriculture was the subject of vigorous debate in 1937-39. Prices had risen after 1932 and net income to farmers had advanced, but prices began to decline in 1937 and continued lower in 1938, 1939 and 1940. Some prices dropped back almost to the low level of 1932. The cash payments were of direct assistance to farmers, but the fact that the money came from taxation led many farmers to feel that they were only paying themselves and that the need was for better markets abroad. The fear that the payment system must come to an end some time led to constant speculation as to the future of AAA. The efforts of the government to broaden the consumption markets by distributing food under the stamp plan to the small-income families was not generally approved except as a relief measure. The war came just in time to check a growing conflict over agricultural policy and to provide a new activity for the thousands of government agents. The several agencies that had been set up to handle farm products owned by the government were available to turn into war emergency agencies. Such a case was that of the Surplus Marketing administration, which was changed into a purchasing agency to collect food for Great Britain.

Agricultural policy changed rapidly in 1941. An increase of about 7% in 1942 was called for by the government for the aid of Britain, and other countries to be aided by lend-lease. The complete about-face, however, did not come until 1942, after Pearl Harbor. The war began for the United States in the early winter, which gave ample time to plan new crop production for 1942. The fact that production jumped suddenly to a new high in 1942 was not so much the result of planning as of favourable weather. While lend-lease exports took about 8% of crop production, the increased yield of 15% more than offset it. The immediate need for supplies for the United States military forces had not become large in 1942 but could be

foreseen for coming years. The general agricultural policy after 1942 continued to be the retention of soil conservation as much as possible while stimulating production where needed and maintaining adequate reserves. By 1944 the administration began to look ahead to the postwar period when the main objective might again be the reduction of production in some lines and the control of surpluses until the world again attained a balance between food production and demand.

Relief needs were larger than expected in 1945 and 1946 and drained off the surpluses that had caused farmers to fear a price decline when peace came. The needs of U.N.R.R.A. were greater than the funds available. The United Nations planned to take over part of the work of relief from U.N.R.R.A. while the rest was turned over to private organizations. The Food and Agriculture organization proposed a World Food board to balance world-wide production, but this scheme was opposed by Britain, who had been one of the chief financial supporters of U.N.R.R.A., and was referred to a commission for further study.

Farm Prices.—At the beginning of the decade 1937–46, farm prices were recovering from the very low level of the five previous years, when the index of farm prices was down to 65 compared with the 1909–14 level of 100. Prices had risen to 121 in 1937 but dropped to 93 in 1939 and then began to advance. The increase in-prices of all farm products was most rapid in 1941, 1942 and 1943, when they advanced from the average of 100 for 1940-to 192 for

Mexican migratory labourers pruning a cantaloupe patch in the Imperial valley, Calif., before World War II. During the critical labour shortage lasting throughout the war, great numbers of migratory workers were absorbed into war industries

1943. This rise was followed by a levelling off in 1943 and 1944, caused by the very large production of those years, then by another rise to 201 in 1945 and to 264 by Dec. 1946. There were wide variations in the price changes of different groups of crops and livestock during the decade. The most striking advances were those in tobacco, cotton, oil-bearing crops, fruit and truck. Tobacco was at 204 in 1937 and 365 in mid-1946. Cotton advanced from an index of 90 in 1937 to 194 in 1946. These annual averages omitted the temporary variations that made records for some crops from time to time. Price ceilings also tended to hold the increases to gradual changes. Prices paid by farmers during the decade followed a somewhat different curve, beginning at a higher level in 1937, which was followed by a slight decline and then a slower rise until 1946. The index of prices paid by farmers for commodities, interest and taxes was at 134 in 1937, declined to 125 in 1939 and then rose constantly to 181 in April 1946. Farm wages advanced much more rapidly, from 126 in 1937 to 362 in April 1946. At the same time the wage earnings of factory workers, which were at 299 in 1937, advanced to an average of 475 in 1945.

The parity ratio (relation of prices received to prices paid by farmers) was at 91 in 1937 and declined to 76 in the two years 1938 and 1939, followed by a steady advance to an average of 116 for 1945 and the first half of 1946. For the period 1921 to 1941, farm prices had been below parity. The parity index rose more rapidly because prices paid by farmers did not advance so rapidly. The OPA's declared policy of holding farm or food prices and wages



from rising was not carried out. If prices of cotton, wool and feed crops were taken out, the food crop index rose at about the same rate as earnings of factory workers until 1943. A comparison of prices during World War I and II showed that prices advanced more rapidly and to much higher peaks in World War I. This followed the trend of all prices, which rose to greater heights by 1918 than they had by 1944. Farm prices in World War II began to rise before the rise in prices of nonfarm products because of the fact that the control of prices was first imposed on nonfarm products. Parity did not reach the level of 1915-19 until 1943, however. The increased income of agriculture in World War II was not due so much to a better price relationship as to the greatly increased volume of production. From 1914 to 1918, all farm production had increased only 5%, but in the corresponding period of World War II it was 22% larger. Crop production actually declined from 1914 to 1918, but gained slowly in the first years of World War II, while livestock output gained much more rapidly in the first years of World War II. The main factor in the gains of crop production in the latter part of the decade 1937-46 was the several years of favourable weather.

Price control began in 1942 with the passage of the Emergency Price Control-act. A price administration was set up in April 1941 as well as a labour board, but without conspicuous results. The law providing for loans on certain "basic" crops at 85% of parity was passed in May 1941. The Steagall amendment providing for support prices on nonbasic crops was passed in July the same year. Under this amendment the secretary of agriculture, and later the War Food administration, was authorized to announce price supports for any products needed for the war effort at any level thought necessary to secure adequate production. This authority was in some respects in conflict with that of the price administration. Numerous conflicts arose which resulted in confusion and misunderstanding both among the officials in charge and the general public. Some orders caused prices of feeds, such as corn, to get out of line with prices of hogs and brought about results contrary to the intended purpose. The divided authority with respect to agriculture became a serious administration problem in 1943 and continued even after the discontinuance of price control in 1946.

The "roll back" order was issued in early 1943 to "hold the line" against inflation. This meant that the prices of meat and butter would be reduced to the level of Sept. 1942 and that subsidies would be paid to processors so that the price reductions would not be passed back to farmers. The Reconstruction Finance corporation paid the subsidies to the processors. In 1943 the secretary of agriculture announced "incentive payments" for several crops to assure production up to a certain goal. These subsidies were made for each farm for output between 90% and 110% of the goal for that farm. The Commodity Credit corporation was authorized to handle certain of the subsidies.

Vigorous opposition to subsidies arose among organized farmers and trade groups, and started a struggle in congress in 1944 that lasted through 1946. The question arose of revising the "parity" concept to bring about a fair relationship between the producer and consumer. The idea of developing a "parity income," rather than market price, received much attention. The Steagall amendment extended the protection of agriculture two years after the declared end of the war. In the meantime, farm prices

were above 100% of parity after 1944 up to 116 in 1946, yet the markets of several farm products were fluctuating widely and farmers were in doubt as to their future plans. Many producers remembered the price break that followed World War I and were planning accordingly, which to some extent accounted for farmers' general conservatism in 1945–46.

A vigorous struggle developed in congress in the spring of 1946 over the renewal of the Price Control act. An interim period was created by the presidential veto of the first bill passed by congress. Prices rose and declined irregularly for several weeks until the second bill was passed and approved. The new Decontrol board found it impossible to restore the controls as they had been, and by Oct. 23, 1946, price controls had been lifted from all foods except rice, sugar, syrup and molasses.

Marketing Costs.—The higher prices of foods and the large total increase in the value of U.S. agricultural production tended to obscure the increase in marketing costs. The consuming public was likely to overlook the cost of distribution represented in the prices paid at the retail store. Measured in the part of the consumer's dollar passed back to the producer, the relationship changed slowly in the producer's favour after the United States entered World War II. The 1935-39 average farmer's share of 40% continued through 1940. In 1941 the increase began and the share was 44%, advancing slowly to 54% in 1945 and to 55% in the early part of 1946. A downward trend to 52% occurred in late 1946 which was attributed to the advance in retail prices and the decline of farm prices. The marketing charges as percentage of retail cost were estimated at 59% average 1935-39; they rose to 60% in 1940, then declined to 50% in 1946.

The national marketing bill for farm products exceeded the amount received by producers for the same products. The importance of this item in the national economy was shown by the fact that in 1939 the food marketing bill amounted to 13% of the national labour income. The business furnished full-time employment for about 4,000,-000 persons. The average cost of marketing farm food products was estimated at an average of \$8,400,000,000 in 1935-39. The total increased slightly to \$8,600,000,000 in 1940 and to \$9,200,000,000 in 1941, then rose to almost \$11,000,000,000 in 1944. Government marketing subsidies covered about 6.5% of the charges in 1944 or \$700,000,000, and with these deducted the total marketing bills showed only a slight advance between 1942 and 1944. Estimates for the years before the decade 1937-46 showed very little change between 1919 and 1939. The increase in volume was offset by the reduction in marketing costs. These marketing costs did not fluctuate as widely as the farm prices or retail value of food products. These estimates cover the changes between the farm and the sale in the retail store and do not represent the cost of services in public or private eating places. The total cost of food to the consumer covers charges for services that changed considerably during World War II, when a larger proportion of consumers ate outside the home. This change is shown by a comparison of the retail value of farm food products and total food purchases by consumers. The latter includes such items as coffee, tea, cocoa and spices which are not products of U.S. agriculture. The 1937 estimate of retail food value compared with total consumer expenditures was as 14.6 to 16.2. By 1944 this relationship was as 21.7 to 30.4. This meant that the consumer was paying a much higher charge for labour in retail food preparation.

Marketing different groups of foods varied in the extent of increases. Meat showed the smallest change and fruits and vegetables the greatest. During the period 1929–40 the cost of labour was estimated to be 45% of the marketing bill. The relationship of the cost of food to total income was of interest in showing the part that agricultural production played in the national economy. The estimated total income per person in the United States averaged \$521 in 1935–39. The expenditures for food per person was estimated at \$118, or 23% of the income. For 1944 the total per capita income was \$1,134 and the outlay for food \$241, or 21% of income. Food cost consumers relatively less during the war years than during the prewar period.

Farm products, particularly high-quality fresh fruits and vegetables, were shipped experimentally by air in 1943-46. These tests indicated that air-borne products would have to sell at a premium for some time to cover the higher cost. In 1946 the competition of new air-freight lines, however, resulted in some rate reductions which promised to stimulate more rapid developments. The great improvements in cargo planes during the decade made forecasts hazardous. It did seem likely that air-transport of certain products such as flowers, the more delicate sub-tropical fruits, and other products which might sell at a premium for high quality would move by air in the near future. The Florida fruit areas were three days away from New York and Chicago by rail but only eight hours or overnight by air. Seasonal production required that other cargos be found in order to employ planes continuously.

World War II placed a great strain on U.S. transportation facilities, and railroad equipment suffered a constant lack of replacements. The quantity of locomotives and cars was constantly short of needs and had not been relieved by the war's end. On the whole, the various transportation facilities did a splendid war job for agriculture, and there were relatively small losses from lack of transportation. Shortages of freight cars led to some considerable losses of grain during the harvest season in the wheat belt, and this shipping was tight through 1946. While the number of freight cars ceased to decline in 1944 the number was inadequate and the losses of old refrigerator cars were serious. Numbers of heavy trucks were increased with the end of the war, but heavy demands for exports continued.

The decision of the Interstate Commerce commission in 1945 reducing class freight rates in the south and west had little effect on agriculture since most farm products continued to move on commodity rates rather than class rates. The decision represented a tendency for more national uniformity in rates, however, which would ultimately benefit farmers.

Price policies were the subject of continual controversy during the whole decade 1937-46. The Agricultural Adjustment administration began with the purpose of raising farm prices by limiting production to market requirements and by cash payments to increase the farmer's income in relation to the cost of the things he had to buy. This policy was opposed by many persons who contended that reducing production did not necessarily raise prices, since a large crop at low prices brought about as much money as a small crop at high prices. Others argued that the parity relation was not fair to producers, since they did not buy the same things that they did in the base period 1909-14. Still others, notably cotton growers, said that high prices turned U.S. foreign markets to foreign producers and resulted in domestic surpluses which would ultimately break the market. The Surplus Marketing administration bought large quantities of farm products for distribution to low-income consumers.

When subsidies were introduced during World War II to secure larger production without raising prices to consumers, the farmers objected on the ground that such subsidies would be a temporary war measure and when removed would break the markets. When the extension of OPA became the subject of a fight in congress in June 1946, the argument over price policies raged even more fiercely. During the interval in July 1946 when OPA was not in force, the price changes were explained by both sides of the controversy as proof supporting their contentions. As some prices rose and then fell quickly the opponents of government control said that free competition would prevent excessive rises. The same situation occurred after the final abolition of price controls (except on sugar, rice, syrup and molasses) in Oct. 1946.

Farm Income.—Both gross and net income of U.S. agriculture rose to new record heights in the war years 1942-46 from a level 1937-41 near the average of the previous two decades. Farming was more prosperous in the years 1937 to 1941 than it had been since 1930 but less prosperous than in the period 1924 to 1930. The boom of World War I lasted only four years and was followed by the great decline of 1921. Stated in terms of money value, the gross income of 1937 to 1941 inclusive averaged \$11,300,-000,000 while that of 1942-46 was about \$22,300,000,000, an increase of \$11,000,000,000. The high record of 1945, \$24,584,000,000, compared with the previous record of \$17,710,000,000 in 1919. This gross income included the amount of cash sales, value of products consumed on the farm, and rental value of buildings. It therefore provided a fair comparison with the gross income of other industries of the nation. In simple terms, it could be said that agricultural output doubled during the decade 1937-46. Government payments which began in 1933 added only a little to the total, about \$367,000,000 in 1937, \$807,000,-000 in 1939 and \$750,000,000 in 1945. These payments were much more important in 1937-39, when total income was lower than in the war years after both production and prices had risen.

From a fairly prosperous condition of agriculture in 1929, the decline brought gross income down to the low point of 1932, when the total of \$6,406,000,000 was less than it had been in 1910—\$7,352,000,000. The farm depression of 1932 was much worse than generally recognized because of the loss of reserves accumulated from 15 years of fairly prosperous conditions. Farmers' net income in 1932 was down to only about three-fifths of the worst year since 1910. Recovery from this very low state had proceeded slowly up to 1937, when there was a slight recession during 1938, 1939 and 1940.

Net income, a more accurate measure of the condition of agriculture, made great increases after 1941. While expenses of production increased, the big yields and higher prices were more important and increased the net return. In 1937, expenses were \$6,126,000,000 compared with net income of \$5,139,000,000. In 1942, expenses and income were nearly the same, but in 1945 the net was approximately \$13,229,000,000 and expenses only \$11,355,000,000. The most prosperous years for U.S. farmers were 1943 and 1944. Expenses of production included wages, rent, interest, taxes and other operating expenses. The latter was the largest item, amounting to more than half the total expenses and including costs of feed, livestock, fertilizer, machinery and fuel purchased and maintenance of buildings and machinery. Hired labour was second and rent of land third; all other items were less than labour

and rent. For example, in 1940, a typical year in the first half of the decade 1937-46, production expenses were as follows: operating expenses, S2,985,000,000; hired labour, \$1,000,000,000; maintenance of buildings and machinery, \$1,095,000,000; taxes, \$446,000,000; interest on debts, \$295,000,000; rent of land, \$363,000,000. By 1944, the operating expenses had increased to \$5,284,000,000; the hired labour bill doubled to \$2,094,000,000; maintenance increased less to \$1,624,000,000 while taxes were about the same; interest was less and rents were up to \$1,100,000,000 because of the additional land rented by farmers who were expanding their operations. The hired labour bill represented the greatest single increase during the period from 1940 to 1944. The latter did not fully represent the increase in labour, because much of the family labour expended during the war was not paid for in cash.

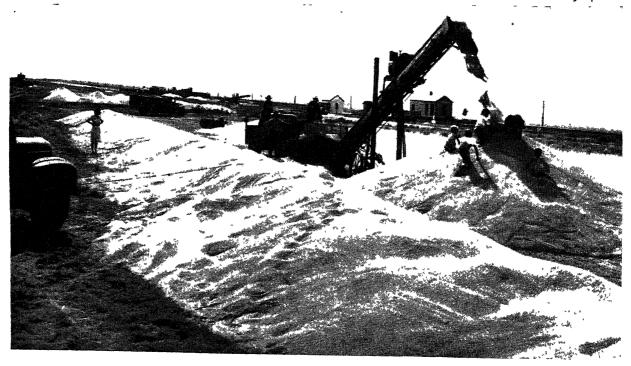
The foregoing totals for all agriculture represented the situation in the industry as a whole but did not show the returns to farms or to individual workers. When the grand total net income was divided by the number of farms, the comparison was \$898 per farm in 1940 with \$2,478 per farm in 1944. The income per capita for the total of about 10,500,000 farm workers for the same years was \$537 in 1940 and \$1,461 in 1944. An estimate of the income per industrial worker for the same years was \$1,279 for 1940 and \$2,326 in 1944. The significance of this increase is best shown by the relation to the base period 1910-14. The income of farm workers was only 145% of the base in 1940, while that of industrial workers was at 219% of the base. By 1944, farmers' incomes had risen to 394% and industrial workers to 399%. The war brought this average income of farm workers in 1944 up to the level of the industrial worker in 1941, but the latter moved ahead to a new high level in 1944. During this same period the farm population had declined from 23% to only 18.6% of total population and the number of farm workers from 10,585,000 to 10,037,000, a loss of more than 500,000 in four years. Estimates for 1945 and 1946 were not expected to show much change except in an increase in the number of workers on farms as the military forces were reduced. Industrial wages in the meantime were increasing. (For the distribution of farm income among different classes of farms and farmers, see the analysis of U.S. agriculture in the introduction to this article.)

The nonagricultural income of farmers had a bearing on U.S. national agricultural production because it tended to maintain the farm population. The amount of nonfarm income was very difficult to estimate, particularly during the war years. The United States department of agriculture estimated the wages and other income to be \$2,100,000,000 average in 1935–39 and \$3,200,000,000 in 1942. This was estimated to be offset by an average of about \$1,140,000,000 paid to city people who worked on farms in 1935–39 and \$1,771,000,000 in 1942. The difference left the net income to farm people at an average of about \$1,000,000,000.

Land Values.—The agricultural industry as represented by real estate values increased nearly 50% during the decade 1937–46. The value of farm land and buildings was put at \$34,757,000,000 in 1937 and \$56,584,000,000 in 1946. The total of all farm property, including machinery, crops and livestock was estimated by the United States department of agriculture at \$42,708,000,000 in 1937 and \$73,140,000,000 in 1946. This gain was due to both higher prices and increased volumes of production. The financial assets of farmers in the form of deposits and currency increased from \$4,030,000,000 in 1940 to \$11,600,000,000 in 1945. Savings bonds increased from \$247,000,000 in 1940 to \$3,910,000,000 in 1945.

Land values began to rise in 1941 after having been fairly stable from 1937 to 1940. The rise was at about the same rate as in World War I and by 1945 had reached 52% above the 1935-39 level. The sharpest rise came after World War I was over, in 1920, when the increase was 70% above what it had been at the beginning of the

During the bumper U.S. wheat crops of 1946, many farmers dumped overflow grain in open fields because of lack of storage space



war. The "land boom" had features similar in the two postwar periods, viz., about half the sales were for cash; about two-thirds of the purchases were by farmers; reselling took place after a brief ownership, the resales making up about one-fifth of the sales; there was an increase in the financing by individuals and commercial banks in contrast to government lending agencies. Buyers were being warned in 1944–46 that prices of land were, in many cases, beyond levels likely to be maintained by long-term farm earnings. Returning soldiers were being warned against buying at the inflated prices. In the vicinity of large cities, sales to city buyers were increasing as the fear of inflation increased.

Mortgages and Credit.-The U.S. farm mortgage debt was reduced from \$7,153,000,000 in 1937 to \$5,270,000,000 in 1945, which was a little more than half of what it was in 1929. Non-real estate debts increased about 6% from 1940 to 1945. These included a variety of loans that had not been made prior to 1937. The Commodity Credit corporation began making loans to farmers in 1934 and by 1937 had put out \$204,500,000, which grew to a total of \$352,328,000 by 1945. In addition the CCC made loans up to \$49,000,000 to co-operative associations. The latter loans declined rapidly during the war years. The Rural Electrification administration, beginning in 1936, made most of its loans to co-operative associations. By 1945 these amounted to \$345,000,000 and other loans by the same agency to over \$15,000,000. The Farm Security administration began in 1935, and its loan business had grown to \$390,000,000 by 1943. Other agencies supervised by the Farm Credit administration were increasing or maintaining their loaning from 1937 to 1946, although a part of the total could not be considered as loans to farmers since they were made for the purpose of market control, price control and other war measures.

The interest rate on farm mortgages averaged 4.9% in 1937, then was reduced to 4.5% which continued through 1941 to 1946. The total of this interest bill declined from \$341,000,000 in 1937 to \$248,000,000 in 1945 as mortgages were paid. Federal land bank rates were reduced from July 1, 1935, to July 1, 1944, to 3.5% compared to the farm loan association rate of 4%. Total non-real estate loans to farmers were reported by the United States department of agriculture at \$1,488,750,000 in Dec. 1937 and \$2,432,290,000 in June 1945.

The farm credit situation became confused by the fact that several different agencies were working in the same field. These included the land banks, federal and joint stock, the several divisions of the Farm Credit administration, the Farm Security administration, the Commodity Credit corporation and several other agencies, together with the private lending agencies of each community. Legislation was proposed by farm organizations to consolidate and clarify the work of these several agencies. These bills were the subject of much discussion in 1945 and 1946 without action by congress except for one act that gave the Farm Security administration loaning activities. There was need for new credit facilities to provide (1) technical advice to farm borrowers on the use of loans, (2) more loans for farm enlargement and adjustment to meet the new need for practical machinery-size units; (3) improved loans for veteran farmers suited to their needs; and (4) loans for farm woodlands, comprising about 20% of the forests of the country. While most of these needs were being met partially by existing agencies, the authority in the laws was not clear enough to assure positive action.

The trend of U.S. agriculture's division into two parts, the family-farm and the purely commercial enterprise,

brought up the idea that government policy should recognize these two classes and provide for them according to their national importance. Since the government was subsidizing agricultural research, education, soil conservation, etc., it was urged that those who were subsidized with loans from the federal government should be guided, or "serviced" with technical instruction to prevent waste of the loaned money. A beginning in this direction was made by the Farm Security administration, in its advice to borrowers and its requirement that definite plans be submitted on the use of the loans. It was also argued that government lending to agriculture under supervision was more desirable than the mere appropriation of large sums for farm relief in years of drought, flood or low prices. About 1,000,000 farms were estimated to be in need of readjustment quickly if they were not to drop into the lower class of unprofitable farms.

As noted above, war veterans were warned to guard against the purchase of farms at prices above their long-time earning power. The provisions for aid under the veterans relief bill stimulated considerable buying of land, but this factor was not considered the cause of the rise in land prices as much as were the purchases by farmers seeking to enlarge their holdings so as to use machinery to better advantage. The lending agencies were using caution to avoid starting new farmers with the handicap of over-capitalization.

Following World War I the farm mortgage debt per acre was at the highest point in history, 261% of the 1910–14 base. In sharp contrast, it was only 113% in 1945. Both interest and taxes were much lower in 1945. Farm real estate taxes reached a high peak in 1929, 281% of the 1910–14 base, and declined to a level of about 182% from 1934 to 1944. Agriculture was considered to be in a sound financial position, able to resist any depression of farm prices that might come during the succeeding decade. The amount of non-real estate loans held by credit agencies and commercial banks exceeded \$3,800,000,000 in 1921 but was only about \$2,400,000,000 in 1945, which was another indication of the more stable financial condition of agriculture.

The Commodity Credit corporation activities represented the largest operation during the decade. Its work began in 1933 with cotton and corn loans, followed in a year or two by loans on naval stores and tobacco. Its field was broadened in 1937 and got into full operation by 1940. During the whole period from its organization in 1933 to Dec. 1944 the total of loans made amounted to \$4,457,688,000. The largest items were cotton, \$1,954,958,000; wheat, \$1,588,824,000; and corn, \$674,369,000.

Payments under agricultural adjustment, conservation and parity programs from 1937 to 1946 constituted a large volume of financial aid to agriculture. The total for 1937 was \$308,193,000, consisting of \$68,742,000 for cotton adjustment, \$2,763,000 for rice, \$11,471,000 for tobacco, \$3,629,000 for sugar, \$871,000 for peanuts and the remainder for general conservation. The cotton program increased to \$265,595,000 in 1938 and then declined each year to \$74,204,000 in 1943. The wheat program increased from \$50,126,000 in 1938 to \$140,449,000 in 1943. The corn-hogs cost averaged about \$150,000,000 per year after 1938. Soil building was the principal conservation activity after 1939, costing about \$140,000,000 annually. The total expenditures for all programs were: \$567,645,000 in 1938; \$709,053,000 in 1939; \$639,472,000 in 1940; \$653,-362,000 in 1941; \$588,054,000 in 1942; \$598,788,000 in

1943; \$804,250,000 in 1944 and about \$711,000,000 in 1945. The sugar beet program under the Sugar act of 1937 involved payments to producers of about \$20,000,000 annually from 1937 to 1946. The cane sugar program cost an average of about \$5,000,000 per year for the continental United States and \$24,000,000 for Hawaii, Puerto Rico and Virgin Islands.

Farm Population.—The total farm population in the United States declined steadily through 1945, to the smallest number since the Civil War. On Jan. 1, 1945, the total was estimated by the United States department of agriculture and census bureau, acting jointly, at 25,190,000 persons. By Jan. 1, 1946, the number had increased to 25,990,000-the first increase after 1932. The actual numbers of persons on farms had increased until 1910 but at a slower rate than total population. In 1910 United States population was 91,900,000 of which 32,000,000 or about one-third, was on farms. The numbers on farms then declined until the depression of 1929, when a back-to-thefarm movement brought the total back to 32,000,000 by 1933 compared to a national population of 125,200,000. The declining trend was then resumed in 1934 and continued until Jan. 1944. The end of World War II marked a renewal of the back-to-the-land movement that had followed World War I for a few years. The increasing efficiency and introduction of new machinery in agriculture enabled practically the same number of farmers to feed the increasing national population.

A large part of the increase in population of the United States in cities had come from farms. The farm population increased in the decade 1937-46 by an average of about 380,000 persons because of the gain of births over deaths. At the same time thousands moved to and from cities, the net result being a loss to the farm group every year of the decade. This loss by removals from farms averaged about 550,000 from 1937 to 1940. With the beginning of the defense organization and enlargements of the army, the farm losses jumped to an average of 1,875,000 during the three years 1941-43. In 1944, this loss dropped to 676,000 and in 1945 it dropped still further, leaving a net increase of 800,000. The year 1945 was the first since 1933 in which farm population showed a net gain. Of the national increase in total population, the farms furnished about 380,000 per year while the former was increasing at the rate of about 1,000,000 persons per year. The other increase came from the excess of city births over deaths and from immigration.

There was also a growing seasonal change in farm population as people moved to farms in the spring and returned to the cities in the fall. This change during 1945 and 1946 was estimated to be about 800,000 persons. The total number on farms was about the same from July to October. The number of males on Jan. 1, 1946 was 13,-080,000 and females 12,750,000. The number of males over 14 years of age was significant as indicating the labour supply. In 1946 these numbered 9,080,000 compared with 11,449,000 in April 1940, before the army draft and the requirements for war industries had much effect. A year earlier the total was only 8,540,000, the low point in farm manpower. Those remaining on farms were of a higher average age because younger men had been taken for the military forces. The loss of 2,400,000 men 14 years and over from 1940 to 1946 was very significant to the farm manpower change. The fact that U.S. agricultural production increased so greatly during the war at the same time that manpower was declining,



Four-H boy and girl harvesting corn during the agricultural labour shortage of 1943 in the United States

was due to the use of more machinery, longer hours by the men who worked, more work by women and children, and the employment of imported workers and prisoners of war.

In 1940 the urban population produced only 74% of the number of children required to maintain a stable population, while the farm population produced 44% more children than were required to maintain rural population. This farm surplus was not sufficient to keep up United States population. The war was expected to change this situation, however, as the general birth-rate was increasing.

What the situation would be in another generation, if immigration was restricted and the farm population became stabilized at a fixed level with no surplus to keep up urban population, was a question yet to be answered. Forecasts indicated that, in accordance with existing trends, United States population would become stabilized about 1950 at about 150,000,000 persons, of whom 20,000,000 would be engaged in agriculture. Some rural sociologists expected the decline in farm population to become stabilized or even to increase following the food crisis of World War II. If the plans to promote better nutrition throughout the world through such agencies as the Food and Agriculture organization succeeded, there would be a larger number of people needed to produce the world's food. Previous surpluses had been largely excessive stocks in particular countries at the same time that more food was needed elsewhere.

The decline in persons engaged in agriculture had been world-wide, however, along with the growth of industrialization. Some of these changes were of timely significance in view of the new emphasis being put on food production to meet all needs. In Great Britain, one of the first countries to be highly industrialized, the population gainfully employed in agriculture declined from 13% in 1881 to 9% in 1900 and to 6% in 1931. In Germany the decline came later, from 42% rural workers in 1882 to 26% in 1939. France changed less, from 44% in 1896 to 35% in 1931; Canada from 48% rural in 1891 to 31% in 1931. Estimates for the less industrialized countries of large population included the following: Soviet Union, 85% agricultural; China 80–85%; India 67%; Spain 57%;

Italy 48%; Japan 49%; Brazil 66%, and most of the Balkan countries 75–85% agricultural. The proper balance between industry and agriculture was beginning to be a problem commanding the attention of the world's economic organizations. The growing organizations of rural people raised the question at several international meetings in 1945 and 1946. Plans were made in London in May 1946 to develop a world-wide agricultural producers' association or union to include the peoples on the land in all nations. The total number of these was estimated between 1,000,000,000 and 1,250,000,000,000, or more than half of the world's population.

Labour and Wages.—The labour supply on United States farms declined with the total number of persons on farms from 1937 to 1946. The average of total family and hired workers in 1935–39 was 10,920,000, of which 8,353,000 were family workers and 2,567,000 hired. By 1941 the total had declined to 10,361,000 and by 1945 to 9,844,000. In 1945, with the return of men from the military forces, the numbers increased about 100,000 and by June 1946 the total was about 4% more than a year earlier. The variation was more with hired labour, the number of which got as low as 1,320,000 in early 1946. About 1,000,000 returned veterans were at work on farms in June 1946. Fewer foreign nationals were at work, and no prisoners of war were employed on farms after July 1, 1946.

With the government's appeal for greater production in 1941 the call for more labour arose at once. The call for help by war industries began to be noticeable in 1940, and by Jan. 1942 estimates indicated that more than 2,800,000 had changed to nonfarm jobs and 283,000 had joined the military forces. A year later, in Jan. 1943, the losses to agriculture were estimated at 3,498,000 to nonfarm jobs and 1,012,000 to the armed forces. The change was less rapid through 1943, and in Jan. 1944 the total loss to the farm labour supply was put at 5,127,000. Included in these totals were many formerly unemployed or not ordinarily counted as farm labour; many were women, and the absence of many was offset by children who began to do full-time farm work. The transfer out of agriculture of full-time adult workers with useful farm experience was probably about 2,000,000, since the total reported as employed on farms in 1945 averaged 9,844,000 compared with 10,585,000 in 1940.

Military deferments were granted to farm workers in 1942; and by July 1943, 1,449,000 farm workers in the 18-37 age group were placed in deferred classes. This stimulated a small shift back to the farms of workers who had left for city employment. The War Manpower commission encouraged men with farm experience to return to the farm, and also issued regulations to restrict the movement of farm workers to nonfarm jobs. The secretary of agriculture was allotted funds to move agricultural workers to points of critical need, and considerable numbers of men were so allocated. In 1943 the Agricultural Extension service assumed leadership in mobilizing all labour resources in rural areas. In April 1943 the sum of \$26,100,-000 was appropriated for the War Food administration to assist farmers to meet their labour needs. A United States Crop corps was organized, and the Woman's Land army and Victory Farm volunteers were started to recruit women, boys, girls and men not fully employed at nonfarm work. Training camps were established to instruct these recruits in farm work. There was a total of several million workers in these classes. Other sources of farm labour were Japanese internees, conscientious objectors and soldiers on leave. Most of the foreign labour brought in was Mexican and Jamaican or Bahamian, about 178,000 in all, and 70,000 prisoners of war.

A problem in 1945 was the low wage level of farm labour compared with what the war workers had been getting. Few were willing to return to the farms at the lower wages. War veterans who were receiving \$20.00 per week in uniemployment insurance payments would not take farm jobs at a lower wage. Houses were an inducement to married men, but these were scarce. Even when higher wages were offered, many servicemen preferred to continue looking for better nonfarm jobs. The number of hired workers as a whole was about 7% larger on July 1, 1946 than a year earlier.

A scarcity of workers was still in evidence in some areas in the harvest season of 1946, although wages were higher.

Farm wages as a whole declined from 1937 to 1939 and then advanced to more than double the average of 1935–39. Hired men averaged \$28 per month without board and \$36.32 with board in 1937, compared with \$92 without board and \$106 with board in July 1946. The upward trend was faster than the rise in farm prices, which advanced to 218% of the 1910–14 base of 100 by July 1946, while wages had advanced 390%. Farm wages were stimulated more by the rise in city wages than by the advance in farm prices. The rapid advance in farm wages began in 1940 as the demand for workers in war industries started.

The area of highest wages was the Pacific coast states, where the index rose to 426% compared with an average of the other regions of only 335%. The smallest increases were in the east south central states, where it was only 290%.

Authority to stabilize wages of agricultural workers,

Unpredictable horn of plenty upset the best-laid plans of 1938 crop control, according to Sykes, who entitled his cartoon in The Philadephia Evening Public Ledger, "Overwhelmed"



given to the department of agriculture in 1942, applied to those earning less than \$2,400 per year. Only a few orders were issued establishing ceilings for farm workers, mostly for California processed crop workers. An order was issued by the Director of Economic Stabilization providing that no employer could decrease wages below the rate paid between Jan. and Sept. 1942 without the approval of the War Food administration. The general level of farm wages was considered substandard. Efforts to organize farm labour appeared before World War II but were strongly opposed by general farmers' organizations and made no substantial progress except in connection with highly specialized operations such as fruit picking, packing, etc. The fact that more than half the total U.S. agricultural production for sale was produced by 10% of the farms indicated that commercial farming was rapidly concentrating into larger units, and that hired labour might become subject to organization. The fact that the typical U.S. farm was a family enterprise was still the stabilizing factor.

While wages varied with the skill of the worker, the promotion of fixed union-hour rates would be difficult to establish. Gross production per farm worker in the United States was 14% greater in 1939 than in 1919, and by 1944 production was 26% greater than in 1939 because production increased 18% and farm employment decreased 6%. The greatest advance was made in the central states, where the introduction of new machines had been greatest. The gain was least in the middle Atlantic and east central states.

The paradox of the war period was the fact that fewer farm workers did a bigger job of production, although several million of the most able-bodied and skilled men left the farms to join the military forces or to work in war industries. Their places were taken by less skilled men or women, children or older men who had practically retired but returned to duty in the war emergency. The average quality of the labour declined about 5%.

Tenancy.—A problem of national concern was acted upon in 1937 when the Bankhead-Jones Tenant act was passed by congress to help landless farmers buy farms. This act authorized loans to farm tenants to purchase farms and repay in 40 years at 3% interest. The farms were to be under the secretary of agriculture for the first five years after purchase, and he might supervise the farmer's operations until the loan was paid in full. In 1930, about 42% of farms were being operated by tenants. By 1940 the number of tenants had decreased slightly to 39% of the total number of farms. In the first year 1937-38, about \$10,000,000 was loaned to 1,840 men to buy farms that cost an average of about \$5,000. By 1940 about 13,250 tarmers had been helped to ownership. As the defense industries attracted labour from the farms the number of tenants decreased. By 1945, nearly 38,000 tenants and share croppers had been helped to buy farms. While this number was not a great part of the 2,500,000 tenants in the whole country, it represented a check on a bad trend. The success of the greater part of these new farm owners was shown by the fact that in 1945 some 66% of the borrowers were ahead of schedule with their payments. Half of the \$50,000,000 made available for farm purchase loans in 1946 was earmarked for World War II veterans. Because of the rise in farm land prices, greater care was exercised in aiding buyers. The average cost of the farms bought in 1945 was \$5,942 compared with \$5,994 in 1944 and \$5,721 for the period 1938-43. Only \$11,699,000 of

the \$15,000,000 available in 1945 was used because good farms could not be found at prices considered satisfactory. The experience of eight years showed that an efficient family-farm could produce a gross income of \$1,500. Loans were also made to farmers to enlarge their farms. With the increasing size of farms, the opportunity for young farmers to get a start was becoming more difficult unless they worked for the large farms for hire. A new class of skilled farm mechanical workers was appearing. These men lived in towns and villages and drove to their jobs in the country. Their organization into unions was foreseen and was attempted in some cases. In areas of highly specialized agriculture this new development was particularly significant.

Farm Security.—The Farm Security administration was created in 1935 and got into full operation in 1937. Created to help low-income farmers, it started as a subsistence program when thousands were without adequate income and evolved into a rehabilitation program that became less urgent when the war began and farm prices rose. About 1,000,000 farm families which were on relief in 1933 were not much better off in 1935. Loans were made to put these people into a position to recover normal incomes. During 1939, about \$20,000,000 was spent as direct assistance to destitute farmers from the drought states and other areas of crop failures. Rehabilitation loans were made to families to buy work stock, meat animals and other essentials to improve their production for living. In 1938, some 232,947 families each added \$269 to their net worth. Thousands were helped to obtain leases at longer terms on the farms they operated. In 1938, more than 18,000 advanced from the status of share cropper to

The homestead project was started in the interior department and later transferred to the Farm Security administration. These projects numbered 175 in 1939 in housing and farming, with a total value of more than \$100,000,000. About 14,000 families were provided with farms and homesteads, and camps for migrants provided for 6,500 other families. This was not a strictly agricultural project but involved considerable relief for suburban families and labourers in the vicinity of industrial centres. The Subsistence Homesteads projects numbered 42 in 14 states for 2,308 families. By 1941 there were 151 homestead developments. Considerable public criticism arose as to the value of these projects. In 1941 the Farm Security administration began to sell them to private associations. By 1942 these projects were being liquidated rapidly, and the nonfarm projects were transferred to the Federal Public Housing authority. There were 142 farm projects with 9,218 units which were about half sold by July 1943. The care of migrant workers came to large proportions. Shelter for 15,000 families in 14 states was built in 1941. A program to improve the medical care of farm families was developed that aided over 100,000 farm families in 35 states. The system provided for health funds and made charges in relation to the size and income of the families. The whole plan, approved by the state and county medical societies, was chiefly available to FSA

Mechanization.—The use of the gasoline tractor on U.S. farms began about 1910 and after 1919 increased steadily in numbers, at about the same rate until 1946. In 1937 there were 1,230,000 tractors on the 6,300,000 farms, about half of which were suited to tractor use until new types of other machines to use with tractors were produced. By 1945 the number had increased to about 2,100,000 tractors. During the war years 1942–45, about 400,000 were sold to

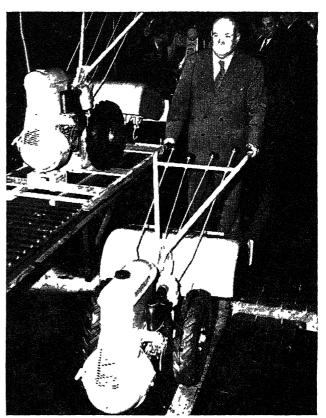
farmers although the shortage of farm machinery was acute. Farm trucks and automobiles increased less rapidly. The number of trucks was reported as 990,000 in 1937 and 1,080,000 in 1945. Automobiles increased from 3,962,000 in 1937 to 4,100,000 in 1945. Farmers could not buy trucks or automobiles except as rationed during the war years, but tractors were regarded as more essential to farm production.

The mechanization movement was greatly accelerated during the latter half of the decade by the shortage of labour. The demand for machines exceeded the supply at all times and led to farm machinery rationing in the fall of 1942 which continued until Nov. 1944. Not only tractors but new type machines operated by the tractors or under their own motors increased rapidly in use. Corn pickers were produced to the extent of about 14,000 per year from 1937 to 1943, but in 1944 25,300 were built. Combine harvester-threshers adapted to complete harvesting of small grains in the field, averaged about 45,000 machines per year from 1937 on. Pick-up hay balers were introduced in 1941; more than 12,000 were sold in 1944. Milking machines were in great demand, 21,500 being made in 1937 and 251,000 in 1944. This machine promised to be in almost universal use in larger commercial dairy farms within a few years. Other machines which increased rapidly in popularity during the decade were tractor cultivators, power sprayers and grinders, peanut pickers and field cultivators.

The newer machines were beginning to out-mode others; the corn-binder, for example, was giving way to the corn picker-shredder. Grain threshers were being replaced by combine-harvesters, etc. Early tractor machinery was mostly for plowing, disking and cultivation of crops. The later increase was in new harvesting machinery, with greater effect in labour-saving than the former. The tractor first operated to eliminate the horse and mule. After 1918, when horse and mule numbers were at 26,700,000, the decline was constant, to only 12,105,000 head on farms on Jan. 1, 1946. The newer types of machines were designed to save man-labour and were rapidly reducing the number of men required to handle a unit of land. It was estimated that about 50% of U.S. small grains were now harvested by combines, and 25.000,000 ac. of corn was harvested in 1944 with corn pickers.

The war production program for farm machinery greatly restricted manufacture to 83% of 1940 output in 1942. In 1943, a further drastic reduction to 23% of 1940 production stirred vigorous protests from farmers, and the quota was raised to 31%. Prices of used farm machinery rose as new machines became scarce, and the OPA in 1943 established price ceilings for five types of machines, whether sold by dealers or farmers. These were combines, corn pickers, corn binders, motor-hay balers and tractors.

Protests arose from the fact that large amounts of farm machinery were being exported. In 1946, a leading tractor manufacturer protested against the shipment of an order of 14.500 tractors by U.N.R.R.A. to southeastern European countries on the grounds that these countries had few machines to use with tractors, poor servicing facilities and practically no provision for the instruction of farmers in the use of tractors. The Civilian Production administration refused to change its plans and stated that it was trying to strike a balance between domestic and foreign demand. American farmers were said to be holding orders for 250,000 new tractors. The use of rubber tires on tractors presented another problem which was serious until the output of synthetic rubber was increased in 1944.



First rototiller off the assembly line at Willow Run, Mich., being inspected by J. W. Frazer. The new self-powered machine was designed for farms of small and medium acreage and put in production on March 26, 1946

The increasing use of farm machines affected the total farm output indirectly by reducing the labour and land needed to support horses and mules for farm power. This gain was estimated at 7% in 1944 over the prewar 1935-30 average. As machines were purchased and the number of horses declined, the crop area formerly devoted to growing horse-feed was used to produce crops or livestock products for sale. This was a national gain in agricultural output but not always a gain to the farmer, who had to buy gasoline, oil and services for his tractors. It was estimated that about 5,000,000 ac. were released from the production of horse and mule feed during the period 1942-44 inclusive. The replacements needed to maintain the tractor numbers on farms was estimated to be about 200,000 per year in 1944, and for a few years after World War II even a larger number would be required because of the lack of replacements during the war. New types of machines were making older types obsolete and were thus stimulating further replacements. The cotton picker was becoming more successful by 1946 and appeared to be on the threshold of mass production. Other new devices such as beet-toppers, flame-throwing weeders. etc., would reduce the demand for hand-labour and favour cheaper production.

Fertilizers.—The production and use of commercial fertilizers expanded about 50% during the decade 1937–46. An average of about 7,300,000 tons was used in the period 1935–39, after which period the output increased steadily to 12,055,000 tons in 1944, and 13,202,000 tons in 1945. Estimated in terms of active elements for plant growth rather than in total weight of the commercial mixtures, the consumption in 1944 was 1.8% of the prewar amount. The trend was toward mixtures of higher plant-food

analysis; hence the amounts used might not fully represent the increase in plant-food applied to the crops. Fertilizer manufacture was maintained during the decade much better than in World War I because of the existence of other domestic sources of raw materials. The AAA promoted the use of fertilizers both in prewar and wartime periods.

Nearly half the total consumption of commercial fertilizers in 1937 was in the south Atlantic states, with North Carolina far ahead of any other state. The south central states came second, with Alabama leading. The cotton belt used about half of the total output. The north central states in the corn belt had not yet begun to use commercial fertilizers except those states on the eastern border-Ohio, Indiana and Michigan, although soil experts had been advising the use of applied fertilizers to establish grasses and clovers. The north central states led in the use of lime, however, consuming in 1944 about 14,000,ooo of the United States output of 23,800,000 tons. The one state of Illinois used nearly 4,000,000 tons of lime fertilizers. Total United States use of liming materials increased from 7,199,000 tons in 1937 to 23,828,000 tons in 1944.

The world's fertilizer production was seriously upset by World War II. European countries, normally large users, were in most cases cut off from their sources of supply, and crop yields declined. One of the first relief efforts was to restore fertilizer shipments in Europe. Despite large supplies of potash in Germany and phosphates in North Africa, nitrogen from synthetic plants was short because of the destruction of most of these plants.

Crop Insurance.—This type of insurance was first made available to farmers on the 1939 wheat crop and the 1942 cotton crop. Crops had been insured against such weather damage as hail in previous years, but no system of insuring against loss of yield had been tried on a large scale. This idea had long been discussed as a possible means of removing some of the risks of farming and assuring a more stable return. Private insurance companies had made some experiments without widespread success. It appeared to be a service that should be a function of the federal government so as to spread the risk widely over the country and thus lower the premium rates to reasonable limits. The Federal Crop Insurance corporation began as an agency of the United States department of agriculture, assisted by other agencies in its early trial work and employing practical farmers to assist in local administration.

In 1943, congress provided no funds except for the liquidation of contracts outstanding. The reasons given for the discontinuance of the insurance by congress were that the majority of farmers had not accepted the plan in the counties covered, and that losses exceeded premiums on wheat by 50% and on cotton by 66%. This loss was due to covering some counties that had exceptionally poor crops, and to the lack of data on which to base reasonable premiums. Experts stated that 10 to 25 years' experience would be needed to determine the lowest safe rate of premiums. This lack of action by congress aroused such widespread protest among farmers that in Dec. 1944 the Federal Crop Insurance act was amended to restore the program of experimentation and insurance. Insurance was not available on the 1944 wheat or cotton crops, nor on the winter wheat crop of 1945. The new law extended the coverage to flax and authorized trial insurance in 1945 to corn and tobacco in a limited number of counties. It also provided that each year thereafter trials could be started on not more than three other crops each year. These trials were limited to 3 years in 20 counties to gain experience. The insurance was against losses due to unavoidable causes. On wheat, cotton and flax the insurance was against loss of yield at either 75% or 50% of the long-time average yield of the farm. The premium and indemnity were determined in units of the crop such as bushels of wheat or pounds of cotton, and payments by farmers were usually made in cash. On the trial crops two plans were offered. One was against loss of the farmer's investment, with 75% coverage. The second plan was for loss of 50% of yield as in the case of wheat, cotton and flax. In the case of tobacco, growers were also insured against loss of quality as well as yield.

Premium rates were generally made uniform for all farms in a county. The cost of administration was paid by the federal government. Provision was also made whereby the amount of insurance increased with the progress of the crop. If the crop was destroyed early in the season, the protection was only about one-half of what it was at the time of harvest. Excessive losses on abandoned acreages were thereby avoided. One-sixth of the nation's wheat acreage had sometimes been abandoned, although the acreage often had been planted later to other crops. The principal problems were to secure larger participation by farmers, to spread the risk over several years, and to determine what the average risk was for each region and crop.

The extent of the use of crop insurance was shown by the records of acreage covered and production insured. In 1939, wheat insurance began on 7,010,000 ac. operated by 165,775 farmers with a maximum production of 60,-826,000 bu. The cost in premiums was 6,670,000 bu. The insured units increased to 400,043 in 1942, covering production of 88,063,000 bu. The crop of 1944 was omitted, and the coverage of 1945 dropped to 25,653 farms on spring wheat only. The cotton program began with 169,-072 units in 1942, covering 407,612,000 lb. of cotton. The amount covered was slightly less in 1943 and in 1944 was omitted. In 1945, cotton insurance was resumed on 113,760 units covering 280,531,000 lb. Flax coverage in 1945 was on 40,419 units and 3,738,000 bu. of flaxseed. On corn the 1945 season covered more than 12,000 farms in 15 trial counties. Tobacco trials covered about 12,500 farms in 13 counties. Early reports indicated that about 500,000 farms would be covered by crop insurance in 1946. All participation was voluntary, but insurance was not provided in a county unless at least 50 farms or one-third of the farms growing the crop to be insured agreed to participate. Areas of excessive risk might be refused pro-

Agricultural Co-operation.-The progress of the cooperative movement among United States farmers was steady and continuous through the decade 1937-46. The number of organizations declined slightly, but the real measure of the movement was the number of members and volume of business. The total membership of marketing and purchasing associations was estimated at 3,200,000 in 1939 and 4,390,000 in 1944. The growth was most rapid among purchasing associations, which included more than a third of the total in 1944. The volume of business was estimated at \$2,087,000,000 in 1939 and \$5,160,000,000 in 1944. Of this total the larger part, \$4,430,000,000, was done by marketing associations. The dairy co-operatives led in both number of members and volume of business. The livestock associations came second in membership, but the volume of their business was less than that of the grain associations. The dairy and grain co-operatives accounted for over half of the total business, and also numbered about half the associations in the country.

Aside from the marketing and purchasing associations mentioned, several other types had become important. Farmers' mutual insurance companies -numbering more than 1,900 had about 3,000,000 members. These companies had nearly \$13,000,000,000 insurance in force in 1942 with reserves of over \$55,000,000. More than 800 rural electric power co-operatives had been organized in the decade, with about 1,500,000 members. Mutual irrigation associations with 175,000 members and 2,000 farmers' co-operative telephone companies with 500,000 members were some of the more important groups. There were also several thousand other types of small co-operative associations serving farmers.

Agricultural co-operation appeared to have become stabilized after 1930 as a form of service well suited to farmers' needs. After the booms in co-operation of the 1880s and 1930s the excessive claims for co-operation subsided. Federal and state legislation encouraged and regulated co-operation among farmers so that there was no struggle during the decade 1937-46 comparable to that in the 1920s for protective legislation. The only late development was the organized effort on the part of some new organizations to secure the revision of the tax laws as applied to co-operative associations. These attacks were based upon the charge that co-operatives had an unfair advantage over private enterprise since their patronage refunds were not taxed as were profits from corporations. The true co-operative was not operated to make profits but merely operated a service which was charged to the member at cost. Profits were not made as from an investment in a corporation. The trend during the decade was toward the consolidation of local associations into statewide, regional and national organizations for more efficient management. The activities of some co-operatives broadened into the ownership of factories to make supplies, mix feeds and fertilizers, etc., as services to their members. These activities also were not operated for profit but entirely as a service to the members. Some co-operatives entered the oil distributing field, as this item had become important to farmers with the increased use of motor-driven machinery. These new activities stirred up some criticism from privately-owned industries. The idea that co-operative organization could assure farmers higher prices through control of large proportions of certain crops had generally been abandoned as a fallacy.

Co-operatives assisted the government effectively during the war period in programs on marketing, storage, etc. These organizations had become a national factor in developing policies for agriculture through their national council, one of the large organized groups of farmers. The financial servicing of co-operatives was placed under the Farm Credit administration, which also controlled the banks for co-operatives. This system included the Central bank and 12 district banks. Loans by these banks to cooperatives were \$97,585,000 in 1937 and increased steadily to \$398,581,000 in 1943, when the volume of farm products was high. The co-operative research and service division of the Farm Credit administration provided a clearing house of technical and administrative service for all cooperatives. An example of such work on wartime problems was that of training sheepmen to prepare sheep pelts to make warm suits for the air forces. As a result of this campaign, some 2,000,000 more pelts than normal were secured. Many studies in co-operative plants resulted in the introduction of new methods that aided in the war effort.

Research and Education.-The state and federal agricultural experiment stations, agricultural colleges and extension services became important agencies during World War II to organize and assist the food production campaign. Using the experience gained in World War I, they had the results of a quarter-century of research to guide the new programs. During these years, tens of thousands of tests and trials had been made. The agricultural colleges had turned out trained graduates, and the extension service had contacted, through its county agents, almost every working farmer in the nation. No nation had ever been so completely organized and trained. Large appropriations for research and education by both federal and state governments had expanded these activities steadily. One such act of congress passed in 1945 provided \$12,500,000 more federal funds to be matched by state funds on the three following years and to be expended almost entirely in counties. The extension service organized more than 1,700,000 teen-age boys and girls for light farm work through the 4-H Clubs.

Foreign Trade.—The foreign markets for United States agricultural products seemed to be disappearing at the beginning of the decade 1937-46. This was due to the growing self-sufficiency policy in Europe, the competition of other exporting countries with lower prices, and the decline in the volume of United States agricultural production from 1931 to 1937. In food products alone, imports exceeded exports from 1923 to 1940, when the net imports amounted to 3% of domestic production. The United States government in 1937 was using the agricultural adjustment program to bring certain crops into line with needs and was also promoting Reciprocal Trade agreements, authorized in 1934, to increase trade by reducing tariffs. Up to the outbreak of World War II, these agreements were negotiated with 20 countries which in the past had provided outlets for about 60% of U.S. agricultural exports. With the outbreak of the war and the beginning of lend-lease operations, other trade controls were obscured, and the operations of international agencies of the United Nations, such as the Combined Food board, dominated. International co-operation began to take form in the making of agreements on specific products. A new wheat agreement was worked out in 1941 and 1942 between Great Britain, the principal importing country, and the leading exporting countries-Canada, Australia, Argentina and the United States. This was revised again in 1946 with 13 nations participating. Preliminary discussions were held on cotton, but no agreement had been made by the end of 1946.

Special agreements on sugar, coffee, cocoa, rubber, etc., were a part of the Allies' war planning and were to extend for the duration of the war emergency.

The volume of agricultural exports had reached a peak of nearly \$4,000,000,000 in 1919 and then declined almost continuously to only \$682,000,000 in 1938. This was 23.7% of total U.S. exports. During the same period, agricultural imports declined from a high of \$3,409,000,000 in 1919 to a low of \$613,000,000 in 1932 and then recovered to \$1,155,000,000 in 1937, which was about the average for the following five years. This was about 25% of total imports. It is important to note that almost exactly half of these agricultural imports were of products also produced in the United States while the other half was of products not produced domestically. The latter included rubber, coffee, cocoa, silk, wool, bananas, tea and spices.

With the beginning of lend-lease in 1941, commercial

exports declined still further until 1945. The volume of lend-lease exports rose to over \$1,000,000,000 in 1942; \$1,800,000,000 in 1943; \$1,600,000,000 in 1944 and about the same in 1945.

Lend-Lease.—The share of agriculture in lend-lease (q.v.)was of more importance than the relative dollar value showed. The amount supplied by the U.S. may have made the difference between victory and a breakdown in Britain and shortened the war by supporting the U.S.S.R. While the total value of foodstuffs shipped amounted to \$5,370,-644,000 to the end of 1945, it made up 10% of the total of nearly \$50,000,000,000. The proportion of food to the total of lend-lease declined after the first year. The United States shipped 6% of its meat supply, chiefly pork, in 1942; 9.3% in 1943 and about 7% in 1944 and 1945. Of dairy products, cheese and dry skim milk were most important; 22.8% was shipped in 1942; 14% in 1943; 23.2% in 1944 and 10% in 1945. Eggs, fats and fish were next in volume. Of dried fruits, the part of U.S. supply shipped rose from 14% in 1942 to 25% in 1945. In 1944, the high year of shipments, 6% of the record supply was sent to U.S. Allies-about 3% to Britain and 2% to the soviet union. Offsetting these exports, considerable food supplies were received by U.S. military forces from Australia, New Zealand and India, amounting to about \$300,-000,000 in value. Of the total shipments, about 60% went to Britain; 29% to the soviet union; 7% to the North African and Middle East area; about 3% to China-India area and less than 1% to other countries.

Total agricultural lend-lease aid reported from March 11, 1941 to Dec. 31, 1945, including food and other products such as cotton, tobacco, seeds, etc., amounted to \$6,060,746,000. At the same time, the value of reverse lend-lease received amounted to about \$800,000,000. Agricultural products were included in other classes of goods such as clothing and military supplies, so that the net total of United States agricultural aid was not much less than 10% of the grand total of \$49,096,125,000 as reported. Some additional shipments to China in 1946 slightly increased this total. Final settlement of the many lend-lease operations were not completed by the end of 1946.

Food and Agriculture Organization.—The progress in the science of nutrition was moving rapidly forward when the decade 1937-46 began; it received a powerful stimulus from World War II. The close relationship of health, food and agriculture had been emphasized by the health conferences at the League of Nations and by the rapidly developing science of nutrition in Great Britain and the United States. When the world-wide food crisis developed in 1939, there were immediate suggestions that an international movement should be organized. As a result, the United States government called 44 of the United Nations to a conference at Hot Springs, Va., May 18-June 3, 1943, on the food problems of the world. Four general objectives were agreed upon: (1) to raise levels of nutrition and standard of living of all nations; (2) to improve the efficiency of agricultural production and distribution; (3) to bring about co-operation among nations to achieve these objects, and (4) to exchange all scientific, technical and other information on action taken and progress achieved. It was also agreed to establish a new permanent international organization to carry out these objectives. Grants of funds were made and an interim commission was set up in Washington, representing the 44 nations to prepare a plan and constitution for the new organization. This





Piles of wheat in the streets of a Texas town in 1944, awaiting storage. Growers were forced to stack the wheat temporarily in the streets because of shortages of manpower, storage space and transportation

commission drafted and proposed a constitution in Aug. 1944 which was circulated among the nations for ratification. At the first assembly of the organization in Quebec, Canada, Oct. 16–29, 1945, the constitution was signed by representatives of 46 nations subject to ratification by their governments. The soviet union was represented by delegates but did not sign the convention. By Oct. 1946, 54 countries had shown interest in F.A.O. and 47 had been officially admitted to membership.

An executive committee was chosen and Sir John Boyd Orr, eminent nutritionist and member of parliament from Aberdeen university, Scotland, was chosen to be the first director-general. The interim commission was terminated and its headquarters at Washington and most of its staff were taken over as the seat of the new organization until the permanent seat of the United Nations organizations should be decided. The program of work was outlined to include nutrition, problems and research, agricultural production and marketing, the collection of world-wide agricultural statistics, the supervision of the world agricultural census, the collection and exchange of technical information and the general advancement of food distribution throughout the world. Forestry and fisheries were included within the scope of the organization because of their close relation to agriculture.

The budget of F.A.O. was set at \$5,000,000, limited to \$2,500,000 for the first two years. Quotas of contributions were set in relation to the various nations' ability to pay. Of the initial budget, the United States' share was 25%, Britain 15% and other nations in smaller amounts. The F.A.O. began to work closely with the United Nations, the U.N.R.R.A. and the Combined Food board on food problems. A conference was held at Washington in April 1946 on urgent food problems which resulted in the

reorganization of the Combined Food board into the International Emergency Food council with more member nations and a broader scope of operations. This council took over the duties of the Combined Food board and other agencies.

Because the scope of the F.A.O. embraced the field of work of the International Institute of agriculture, which had been the leading international agency for agriculture since 1905, the United Nations agreed at the Quebec meeting that the work of the institute should be absorbed. Accordingly, the nations which were members of the institute met in a general assembly at the seat of the institute in Rome, Italy, July 8-9, 1946, and adopted a protocol dissolving the convention of 1905 under which the institute was operated. Arrangements were made to take over the extensive library and archives of the institute; to employ or pension its staff and officially to conclude its affairs. The buildings of the institute, which were the property of the Italian government, were offered to F.A.O. for future use for a branch office. By this action the international collaboration of the nations for agricultural advancement began a new era, inaugurated 40 years earlier upon the initiative of an American, David Lubin, and under the sponsorship of the King of Italy. The second conference of the F.A.O. was held at Copenhagen, Denmark, Sept. 2-10, 1946. The organization was developed further on plans laid down at Quebec in 1945. The principal proposal for action was a plan for a World Food board to work for the better distribution of foods to nations in greatest need, and to plan for the improvement of the diets of people in many countries. A commission was set up to work out and suggest details of operation. The matter was to be referred to the member governments for turther consideration.

World Agriculture

In its relations to U.S. agriculture, world agriculture entered a new era during the decade 1937-46.

Although the foreign trade of the United States had shrunk to a low level during the interim between World Wars I and II, the conviction that national self-sufficiency was a fallacy in modern times came to be more widely understood by U.S. people. The Atlantic Charter declarations and other United Nations pronouncements on the world-wide nature of the food and welfare problem stimulated widespread discussion and thinking. The worldwide military campaigns of U.S. forces promoted acquaintances with conditions in foreign lands, and the returning veterans scattered their observations widely. The phrase "America can feed the world" had real truth notwithstanding the exaggeration. The enormous amounts provided for the Allies was the amount needed to squeeze through the war and turn the tide. A review of the contribution of the several Allied countries supported this view.

During 1942-44, United States exports of foodstuffs increased 395% and amounted to 33% of all the exports of the ten leading surplus-producing countries. Canada was second with an increase of 189% in exports amounting to 16% of the total. All other countries contributing to the food supply, including Australia, New Zealand, Brazil, Uruguay, Chile, Egypt, India and Argentina, contributed less exports than in prewar years. All except Argentina contributed less than 10% of the total. Argentina was the world's leading exporter of foodstuffs before the war but did not increase her production and contributed only 17% to the export supply in 1942-44.

With the great contribution to the world's food supply, the product of a quick acceleration. it was not surprising

that agricultural leaders should voice alaim as to the prospect of surpluses in the postwar decade. The record of agricultural production throughout the world during the war therefore became a matter of intense interest. In 1937, world food production was increasing at about the same rate as population. This increase continued through the war period up to 1943, after which the great losses in Europe caused a reduction in the world total. The great efforts of Germany and Italy to increase food production were being vigorously pushed in 1937 and with good results when not handicapped by bad seasons. The reduction of imports led to the consumption of more of the home-grown product in these countries. In general, however, Europe was better prepared for the war so far as good production was concerned than at any time since World War I. The extent to which German economy was organized for self-sufficiency was not recognized by the Allies until the war was well under way.

North America was the area of great expansion. Canada had a bad year in 1937 but made a phenomenal recovery in 1938. The United States increase was steady and rapid. South America as a whole increased production with Brazil making the greatest gain. Food crops were substituted tor coffee. In western Europe and North Africa, production held its own; the cereal crops were expanded after 1939 because a larger part of these could be used as food. Meat and egg output declined as soon as the blockade checked the imports of feed stuffs. The years 1940 and 1941 were unfavourable, and livestock numbers declined. There was a decline in the middle east except in Palestine and Turkey. In Australia, New Zealand and South Africa, the outlet of food products was limited by the shortage of shipping. Later the shortage of manpower held expansion in check, and the drought which began in 1940 further retarded output. In Asia as a whole there was relatively little increase in food production during the decade 1937–46. While reliable statistics were scarce the best estimates indicated that population had increased faster than lood supply. Almost all available land was being used and there was little chance to increase production except through better yields from larger use of fertilizers, better seed and cultural methods.

Canada.—In agricultural production, Canada remained in the class of Australia and New Zealand—countries producing the largest surpluses over domestic needs. Canada therefore played a heavy role in the food battle of the decade by providing her mother country with a large volume of food and other farm products. By close co-operation with Britain and good planning, exports were more than doubled by 1943 and increased even more in 1945 and 1946. By 1944 Canadian food exports had increased almost 200% over prewar years and made up 16% of the world's total exports, second only to the United States in output.

Canadian wheat usually accounted for about two-thirds of the food production of the country. The fact that most of the crop continued to be grown in the western provinces, where the seasons are variable, accounted for the wide fluctuations in production. The crops of 1940 and 1942 were nearly 90% above prewar production, while those of 1941 and 1943 were about 20% below the normal. With wheat comprising 66.7% of total food production, dairy products were second, about 10%; meat animals 9%; vegetables 5.6%; fruits 1.3% and the rest poultry, eggs and sugar of small importance. The wartime changes were principally in livestock products. Pork production steadily

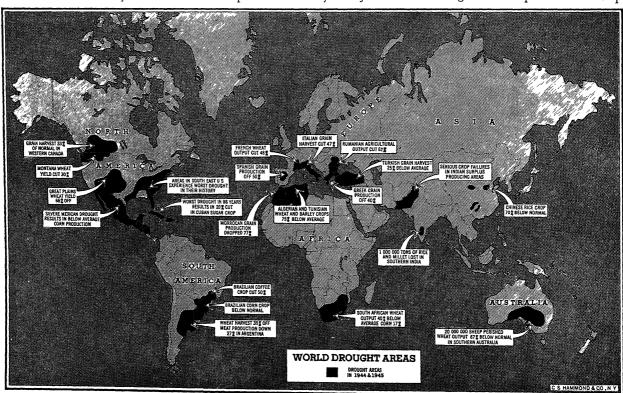
increased and had doubled by 1943. Cheese was increased a third and milk by one-fifth. Poultry and eggs were increased nearly 60%.

Mexico.-The agriculture of Mexico remained on a noncommercial scale during the decade, as most of the country's small farms were barely self-sufficient and produced no surplus for export. From the limited statistics available, corn provided over one-third of the total food supply, wheat 10% and beans and bananas each 5%. Livestock statistics were not available. Most of the poultry and dairy products were for local use, but large numbers of cattle were exported to the United States. While the country as a whole is usually very short of fats, large numbers of hogs are raised and killed for local consumption. During the decade 1937-46, Mexican farm production rose steadily; the increase was more rapid after 1940. In 1937, the banana crop for local consumption was only about half the average of 1935-39 because of a widespread outbreak of the leaf-spot disease. This loss was overcome slowly up to 1945. Corn, wheat, potatoes and beans increased from 1940 to 1946. The shortage of fats and oils led to an increase in oil crops, which became five times as large as in prewar years. Peanuts, sesame and cacao beans were greatly increased. Sugar production expanded over 50% and crops as a whole about 30%. Mexican fruits, vegetables and oils found their outlet to the United States since the shortage of shipping prevented shipping to distant markets. The special banana ships were taken for military uses, and transportation by rail, with limited refrigeration, resulted in large losses in transit. Shipments of fresh vegetables were also limited. Mexico increased the production of special fibre crops to quite an extent as an aid to the war effort. The Mexican cotton crop of about 500,000 bales was of the same quality as United States cotton and was sold largely by American firms.

Cuba.—About three-fourths of Cuba's exported products had been taken by the United States up to World

War II. Great Britain took 15% and the rest was mostly distributed among other West Indian islands. In 1937 and to the beginning of the war, Cuba was slowly increasing her output. Sugar remained by far the most important food product. Tropical fruits and early vegetables were increasing in importance in 1937 but dropped off sharply when German submarines appeared in the Caribbean area. Cuba imported all of its wheat and flour, 90% of its rice and most of the lard consumed. Because of the shipping shortage, Cuba became more closely linked to the United States during World War II. The strong demand for tobacco and its high price during the war brought added income to the island. The Cuban sugar crop averaged about 3,168,000 tons in 1935-39 and increased to a record crop of 4,741,000 tons in 1943, but the drought of 1945 cut production 20%. The country experienced great difficulties in 1945 as food supplies were short and shipping restricted. The Commodity Credit corporation purchased the four entire Cuban sugar crops during 1942-45, except for amounts needed for domestic consumption and some for other Caribbean Islands. This sugar was divided among the United States, Canada, Britain, the soviet union and other areas by the Combined Food board. The Defense Supplies corporation purchased the surplus of blackstrap molasses, mostly for alcohol making.

Caribbean Islands and Central America.—This region became the hunting ground for scarce tropical supplies like rubber, drugs, spices, etc., as soon as the war started. Before the beginning of the decade in 1937 the first steps toward the agricultural improvement of that area began with the extension of the good neighbour policy. The Pan American Union had attempted to promote agricultural co-operation between the hemisphere's countries with some success. An Inter-American Agricultural congress was a further step which developed into a broad program in 1943 and later. World War II advanced the movement and resulted in the creation of the Inter-American Institute of Agricultural Research at Turrialba, Costa Rica. By this joint effort the region was expected to develop



commercial crops that would increase trade and the income of the people on the land. Crops of sugar and tropical fruits were exchanged among the islands, and most of the surplus was shipped to the United States during the war years. The drought of 1945 severely reduced the production of all of the Caribbean Islands. In Central America the loss of the banana trade was the worst blow; recovery was beginning very slowly in 1946. Foodstuffs were imported in the period 1943-46 because of shortages resulting from the drought and the loss of exports with which to buy foods. This area had not attained a balanced selfsupporting agriculture except for the primitive rural natives. The exports of bananas, coffee and cacao were exchanged for wheat, fats and oils from near or distant countries. The city populations required more imported foods than the rural natives who were practically selfsupporting.

Argentina.-World War II brought about a change in the agriculture of Argentina. The wheat crop declined to almost a third below the prewar level, corn production was only two-thirds as great in 1946, and flaxseed gave way to sunflowers grown for oil. Following the end of hostilities the grain production was expected to recover. In the prewar period 1935-39, Argentina led the world as an agricultural exporting nation. This was due to its comparatively small population and large agricultural resources. The Allied blockade cut off trade with Europe except to Britain. The United States took wool, oils, cheese and casein; Britain took meat, and Brazil imported wheat. A surplus of grains accumulated when exports declined faster than acreage. Part of the surplus corn was burned as fuel for power heat when coal and oil could not be imported. The government supported grain prices and regulated the grain trade. Rice production increased until the country was nearly self-supporting in this cereal. The big demand for vegetable oil led to the expansion of sunflower growing until in 1944 it was almost 700% above the 1935-39 average. The oil-seeds crushing industry was expanded until the country had an export balance in vegetable oils by 1945. The country maintained its position as the world's leading producer and exporter of flax-

Animal production was maintained and expanded in some instances. Britain took large quantities of frozen boned pork as well as considerable beef. The United States bought canned meat for the military forces. Pork production increased nearly four times over the prewar period, thereby creating a market for part of the corn surplus. Beef and mutton production increased less. Cheese made the greatest gain, but all dairy products increased about 75%. In 1945, total Argentine food production was estimated at 96% of the 1935-39 period because of the drought that continued from 1944 through 1945. Pastures were damaged as well as crops, resulting in the liquidation of large numbers of hogs and some cattle. The new Argentine government made great efforts to increase foreign trade early in 1946. Decrees were issued governing the purchase and sale of oil-seeds and oils by the government, and prices were fixed for domestic and export sale. Grains, including rice, were under export permits. A bonus was offered for wheat early in 1946 which resulted in a large volume collecting in the hands of the government for export.

Brazil.—With the exception of wheat, Brazil had become practically self-supporting in food production. The large exports of coffee remained the bulk of export trade, and imports of agricultural products were small. The wheat came from near-by Argentina, although considerable wheat

flour was imported from the United States. In the prewar period, exports included a small amount of meat, sugar, fruits, rice, cocoa, cotton and cottonseed oil. Meat exports increased after 1939 to 1944, then declined during the drought. This drought was followed by floods in some areas in 1944 and 1945 and reduced both crop and livestock production. The Brazilian government fixed minimum prices for rice, beans, corn, peanuts, soybeans and sunflower seed. The citrus fruit industry suffered during the war because of the limited markets. Meat and sugar were rationed because of short supplies, although exports of sugar to the Allied countries amounted to about 50,000 tons annually. Total sugar production averaged over 1,350,000 tons during the war years compared with a prewar average of 1,155,000 tons in 1935-39. The area of grains and oil seeds was made possible by the reduction in cotton acreage. Cotton production had increased steadily to 2,075,000 bales in 1937 and continued close to that amount until 1945, when the crop dropped to 1,400,000

Coffee production in Brazil declined steadily after the beginning of the war. The average prewar crop, 1935–40, was about 23,000,000 bags; it dropped to 16,700,000 bags in 1941, 13,080,000 bags in 1944 and 9,500,000 bags in 1945. Exports declined to 7,280,000 bags in 1942, and then increased to 12,500,000 bags in 1945. The Brazilian government placed a tax on new plantings and an export tax to buy surplus coffee to be destroyed. From 1931 to 1943 the government bought part of each grower's crop for destruction and during this period more than 78,000,000 bags were destroyed. The possibilities for the expansion of coffee production were so large in Brazil that measures of control were expected to be continued unless the world's coffee market could be brought under an international commodity agreement.

Other South American Countries.—Uruguay produced a slightly larger total farm output during the latter half of the decade 1937–46, the increases being chiefly in sunflower seed and peanuts. Wheat production declined because of export restrictions, and there was only a slight increase in livestock, which suffered severely in the drought of 1945. The nation imported more than it exported.

Paraguay changed relatively little during the decade. The only export of importance was meat.

Chile's most notable change during the decade was an increase in rice production. By 1946, the output was nearly ten times the prewar average. This changed the country to the export basis, which amounted to more than 50,000 tons by 1945. Chile was self-supporting except for sugar and beef before the war. A surplus of exports in prewar years was changed to a surplus of imports during the war, although quantities of rice, beans, grains, lamb and mutton and fruits were exported. The sugar imports came largely from Peru and the live cattle from Argentina. The mineral output of the nation paid for the surplus food requirements.

Bolivia, not a self-supporting country in agricultural products, experienced difficulties at times during World War II in securing adequate imports. Agriculture suffered from the loss of its workers to the mines. In 1945, acute shortages of wheat, flour and meat developed from transportation difficulties. Wheat was shipped from the United States. Meat was brought to points of critical need by airplane. The crops of 1946 were expected to be short because of scarcity of farm labour.

Peru, like Paraguay, changed little during the decade.

An export surplus of sugar was produced in quantity slightly below the prewar amount. The country continued on the import basis and production, including that of cotton, did not increase because of labour shortage and scarcity of fertilizers.

Ecuador expanded her production of rice and cacao. As soon as shipping was available the output of bananas would be increased. The government aided the development of new rice and sugar lands through irrigation.

Colombia, a tropical country with a balanced production, continued to import and export little. Efforts to secure supplies of tropical products during the war led to some small increases in these exports.

Venezuela, another country with inadequate agricultural production, encouraged a very slow expansion of cultivated crops. The government attempted to expand corn production and increase the meat supply by limiting exports.

(J. C. Ms.)

Great Britain.-In 1931, Great Britain reverted from free trade to a protectionist policy, and by 1937 most of the important farm products were subject to one or other of the common methods of protecting agriculture; but at that time the international situation and the need to safeguard food supplies made necessary a new policy. Thus the Agriculture act of 1937 introduced a new principle of agricultural assistance in the form of the so-called "land fertility scheme," by which the state offered contributions to cover 50% of the cost of certain fertilizers and drainage operations (in 1939 this was supplemented by the offer of a cash bonus of £2 payable on every acre of old pasture or meadow land plowed up). The food (defense plans) department became a new branch of the board of trade. Finally, the ministry of agriculture and fisheries approached certain selected persons to constitute the countycommittees which were to function as the minister's agents in the event of war.

As a result of these developments farming in Great Britain in 1939 had "become in practically all its activities an assisted industry with controlled prices, no longer determined by the world market but sustained by contributions, direct or indirect, from the exchequer which in gross amounted to about one-fifth of the total value of the output from the land." (Sir Daniel Hall, Reconstruction and the Land.)

Nevertheless, certain important fundamental trends of development, dating back to the 1880s, continued. The dominant feature was the change-over from arable to grassland farming with the contemporaneous development of livestock husbandry. British agriculture was drifting away from the production of staple commodities such as wheat, second quality meats and butter and cheese-all commodities with world markets and world prices. By 1937-38, livestock and livestock products accounted for over 70% of the total value of the gross output of British agriculture. Moreover, dairy products accounted for 25.7% of the total farming output. The other major products in order of financial importance in 1937-38 were: horticultural crops (13.4%). pigs (10.3%), poultry and eggs (9.7%), sheep and wool (9.1%), cereals (6.3%) and potatoes (5.5%).

This preoccupation with the production of milk, poultry and eggs, and fruit and vegetables was made possible by two conditions: the first was the availability of ample imported supplies of the relatively low-priced human foods. Thus, in 1938 Great Britain consumed about £650,000,000 worth of food of which it produced only one-third. Milk

and potatoes were the only two important food products in which it was self-contained. In 1938, Britain was spending about £1,000,000 a day on imported human food, importing 76% of wheat and flour, 50% of meat, 72% of sugar, 91% of butter, 72% of cheese, 44% of eggs and 68% of raw fruit.

Secondly, the actual production of British farms was also dependent on the availability of cheap imported supplies of certain raw materials, especially animal feeding-stuffs and fertilizers. Roughly 25% of the feed consumed by farm animals and birds was imported at a cost of about £50,000,000 per annum, and before 1939 British farmers were spending some £8,000,000 a year on fertilizers of which roughly 36% had to be imported because there was no home alternative.

The magnitude of the task facing British agriculture at the outbreak of World War II was most effectively shown by a few simple comparisons with the position in Aug. 1914. First, there were 5,000,000 more people to feed, and the consumption of food had risen from 21,000,000 to 25,000,000 tons. Second, over 300,000 workers had left the farms. Third, nearly 3,000,000 ac. of land had been lost to agriculture and the arable area was down by nearly 2,500,000 ac. Fourth, there was a much greater livestock population—873,000 more cattle, 1,067,000 more sheep and 1,271,000 more pigs. Fifth, dependence on imports for both human food and livestock feed was in consequence greater than ever. But, sixth, the country had 3,000,000 tons less of merchant shipping to carry these imports.

The task of British agriculture in 1939, therefore, was to increase the domestic output of food and to save shipping space.

Wartime Organization of Agriculture.—At least four different ministries were concerned with the control of British agriculture from 1939 onwards-the ministries of food, supply, labour and national service, and agriculture and fisheries. The three former delegated most of their duties, if they concerned production, to the ministry of agriculture. The ministry of agriculture worked through the County War Agricultural Executive committees which were set up in every county throughout the country. The committees came into being immediately on the outbreak of war. The members were appointed by, and were directly responsible to, the ministry of agriculture. Each committee consisted of nine or ten members and was assisted by a paid executive officer (appointed by the minister) and a staff of technical assistants. The county committees worked through sub-committees and district committees. The subcommittees were functional; district committees were territorial, their members being local farmers appointed by the county committees and not by the minister, and they had no executive powers: they were in effect the last link between the minister and the farmer.

Contact between the county committees and the ministry of agriculture was maintained through the ministry's land commissioners. From 1940 onwards a small number of liaison officers, appointed personally by the minister, performed the important double function of interpreting policy to the county committees and reporting back to headquarters on reactions and developments in the counties.

The county committees were given very wide powers delegated to them by the minister of agriculture under defense regulations (in particular D.R. 62). In the exercise of these wide powers the C.W.A.E.C.'s activities could be divided into the following main categories:

First, the issue of directives to individual farmers to produce the annual requirements decided on by the ministry

of agriculture and the ministry of food. These targets were split up into county quotas and allocated between the district committees, thence to the individual farmer.

Second, the C.W.A.E.C.s were responsible for the granting of permits for the allocation of goods in short supply (a formidable task, since many important farming requisites were scarce, and needed careful allocation); for administering the scheme for the reservation or release of farm workers, and the registration and organization of machinery and threshing contractors.

Third, the committees rendered certain specific services. The more important were: the employment of a reserve pool of labour and machinery; the direct contracting for carrying out operations on farms where the farmers themselves were unable to carry out the directives; the reclamation of derelict land, the cultivation of common land and the running of farms where no suitable alternative tenants could be found; the execution of work and the supply of goods on credit under a goods and services scheme.

The committees were responsible, too, for farming efficiency in the counties, but the most important control function was concerned with the general oversight of farm management as such. Where inefficient farmers failed completely to respond to advice and encouragement they could be dispossessed, but only with the specific authority of the minister. The technical development sub-committees were specially entrusted with the administration of an educational and advisory scheme for farmers and laid the foundation of the national agricultural advisory service which came into being in Oct. 1946.

Finally, the C.W.A.E.C.s were also concerned with the administration and supervision of the many subsidy schemes, such as the grassland plowing grant; grants for liming, manuring, drainage and bracken eradication; acreage payments for wheat, rye and potatoes; grants for the installation of piped water supplies; subsidies for hill-sheep and hill-cattle; and schemes for the financial assistance of producers on "marginal land."

The Production Program and Its Achievement.—Effort was concentrated on the extension of the acreage under the plow. It was the accepted view that "one acre of average arable crops feeds far more human beings than one acre of average grassland, whilst one acre of average wheat saves at least as much shipping as seven acres of the best grass in England." A successful campaign was launched in Sept. 1939 for the plowing up of 2,000,000 ac. of grassland in England and Wales alone to be planted to crops for harvesting in 1940.

In the autumn of 1940, the minister of agriculture announced a more comprehensive program of agricultural development. Farmers were assured that they would have guaranteed markets and guaranteed prices for their produce for the duration of the war and for one year thereafter, but would be called upon to use their farmlands in the best interest of the nation. To make this program possible, a hurried farm survey was carried out in 1940, and in 1941 a new and comprehensive survey of every farm in the country was launched and the new "Domesday" records of the farms of the country became in due course the invaluable basis for the subsequent annual production plans in agriculture.

In these annual plans, the emphasis continued to be on increasing the arable acreage to the limit of the country's resources, and farmers were urged to plow up all available grassland. But an order of priority was now adopted for the products of agriculture. This was done in consultation with the ministry of food, and due regard was

given to the nutritional welfare of the nation, to the efficiency of production and to the shipping situation. The production of all the milk possible was placed as the first priority call on the farming industry; potatoes came second because of their productivity and general use; wheat was to be given first priority among the cereals, and sugar beet and certain vegetables were also ranked high in the scale of requirements. Farmers were also urged to grow as much cattle food as possible in order to make the attainment of the milk target possible from the resources of British farms. Finally, farmers were also urged to keep as many other livestock as was consistent with the above priorities, but beef-cattle and sheep were to come before pigs and poultry.

In translating the national policy to the individual farm plan, regard was given to the varying physical conditions of the farms concerned. But in general farmers were urged to grow the so-called "dual purpose" crops, suitable for both human and animal food. The extension of ley farming as-a means of guarding against the exhaustion of soil fertility was widely advocated and adopted, and from 1943 onwards greater attention was paid to the efficiency of livestock production and especially the management of dairy cows. A comprehensive survey of all dairy herds was carried out, and drastic measures were taken to cull uneconomic animals; every effort was made to raise the standard of the ordinary commercial herds to something more nearly approaching that of the best producers. From 1943 onwards, steps were also taken to prevent any further decrease in the numbers of pigs and poultry, and especially to preserve a nucleus of good breeding-stock for later development.

The year 1944 witnessed the peak of the wartime drive for increased products of priority foods from British farms. It was also the first year of the four years' plan for the industry announced by the minister in July 1943. The main features of this plan were (1) no further increase in the arable acreage to be attempted, (2) the plowing of old grassland and the reseeding of cropped fields to be continued in order to enlarge the supplies of animal fodder and (3) greater emphasis to be placed on the improvement of livestock and restocking of land for postwar development. The year 1945 heralded a very tentative return in the direction of peacetime levels, but international conditions in 1946 slowed down this return, and British agriculture continued to be dominated by a measure of planned control.

The material results of the wartime drive to increase the production of British agriculture are best shown by a few comparisons of the position in 1939 with that in 1944 when the drive was at its height. The more significant of these comparisons were as follows:

- (1) In spite of the reclamation of much waste land since 1939, the total area of crops and grass in the United Kingdom actually had fallen by 600,000 ac. This reflected losses of farm land to military and to other nonagricultural uses.
- (2) Nevertheless, on this decreased agricultural acreage the total tillage (i.e., crops and fallow) was increased by nearly 66%. In 1939, the area under crops accounted for only 28% of the total cultivated land (crops and grass), but by 1944 this proportion had increased to 47%. In addition, the acreage under "temporary" grass had been expanded, while "permanent" grass had been reduced from 59% to 38%. By 1944, nearly 6,000,000 additional acres had been plowed up and put under crops and nearly 750,000 ac. put under temporary grass.

(3) The following increases were achieved in the acreages planted to individual crops: wheat 82.9%; barley 95.5%; oats 51.8%; sugar beet 25.8%; vegetables 66.4%; potatoes 101.8%. In terms of food produced, the output of wheat, barley and potatoes was more than doubled, and there was an increase of one-third for sugar beet and vegetables.

(4) The acreage of fodder crops was increased by nearly 600,000 ac. or 40%. The bulk of the extra feed available went to maintain the production of milk and to offset the reduction in the import of animal feeding-stuffs which had dropped to only 156,800 short tons by 1943 as compared

with over 6,720,000 short tons in 1939.

There was also an outstanding expansion of flax production. The acreage grown for fibre in England and Wales in 1939 was trifling; in 1944 it had risen to 51,000 ac.; the acreage in Northern Ireland increased from 21,000 in 1939 to 125,000 in 1944.

(5) The cattle population was increased by nearly 700,000, which reflected the success of the effort to promote milk production, but there was a drastic reduction in other farm livestock. Thus by 1944 there were 6,300,000 fewer sheep, 2,500,000 fewer pigs and 19,200,000 fewer poultry.

(6) It was estimated that "the net output of human food from British agriculture had increased by at least 70% in terms both of calories and of protein. The outcome of this agricultural program, coupled with the control of food distribution was that, by 1943, it had become possible to maintain total food supplies at an adequate level while at the same time reducing imports of food by 50%, thus releasing an equivalent amount of shipping for other war purposes." (Statistics Relating to the War Effort of the United Kingdom, London, 1944.)

These achievements were accomplished in spite of the loss of about 100,000 regular male workers from the farms, which occurred notwithstanding certain measures taken to stem it. Thus calling-up arrangements for military service provided for the retention of all "key" farm-workers on the land. The most significant step affecting farm-workers since 1939 had been the progressive increases in their remuneration. Thus the average minimum rate of wages, which was about 34s. 9d. per week in Aug. 1939, was raised to 48s. in May 1940, to 60s. in Jan. 1942, to 65s. in Dec. 1943, to 70s. in March 1945 and to 80s. in July 1946.

The depletion of the agricultural labour force was partly made good by the recruitment of the women's land army, the enrolled strength of which was over 80,000 by the middle of 1944. In addition, farmers were assisted by schoolchildren and adult volunteers. In 1945 and 1946, they had to depend very much on prisoner-of-war labour. Finally, the execution of the task was made possible largely through the increase in mechanization and especially in the use of tractors. (From a figure of 50,000 tractors in 1939 there were 125,000 in use on British farms by 1943.)

Marketing and Price Policies.—On the outbreak of World War II the government, through the ministry of food, either purchased, or controlled the purchase of, most of the staple food products. Livestock, sugar beet and eggs were bought at fixed prices; other commodities were controlled either by price-fixing or by the licensing of traders.

It was the policy of the ministry of food to interfere as little as possible with the normal channels of selling farm products. The most drastic changes in marketing farm products affected livestock. The farmers sold their livestock to the ministry of food at designated centres licensed by the government, and at which the stock were graded.

Before 1939 there were 16,000 slaughterhouses in England and Wales alone, and the wholesaler purchased his supplies from any convenient market or farm. By 1944, only 750 slaughterhouses were operated by the ministry of food.

It was in the field of prices that the policy from 1939 onwards vitally affected the agricultural effort. This policy was designed to use the fixing of prices as a lever to direct production towards priority products such as milk, wheat, potatoes, and sugar beets. In some cases these prices were buttressed by payments of special subsidies over and above the fixed prices of the products, e.g., \pounds_3 an acre for wheat and \pounds_{10} an acre for potatoes. Thus the price policy was used as an instrument of social policy directing demand towards certain essential commodities.

In Dec. 1944 the government declared its intention to continue its wartime system of guaranteed prices and assured markets for farm products, and this policy was reaffirmed and developed in Nov. 1945. An important feature of the new policy was the establishment of a dual price system. There were "minimum prices" on the one hand, and the government ensured that the "actual prices" would not fall below the minimum levels. For the fixing of minimum prices a system of four-year overlapping periods with biennial reviews was adopted. Thus minimum prices were to be announced three to four years in advance for livestock and for livestock products, and 18 months before harvests for cereals, potatoes and sugar beets. The actual prices for all products coming under the plan were fixed in advance for 12 monthly periods after annual reviews to be held in February. Both minimum and actual prices were fixed with due regard to the need for the greatest possible efficiency and economy in methods of production. Account was also to be taken of any modifications in the character of the agricultural output which might be necessary to meet changing national requirements. Above all the attempt was made to reconcile a reasonable measure of price stability in the short run, with the need for price adjustments to keep production abreast of general economic conditions, an experiment calculated to eliminate the disconcerting fluctuations in farm prices within a given production period which, in the past, made farming a gamble and benefited neither producer nor consumer.

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Union of South Africa.—Crop production was not on a high level at the beginning of the decade 1937-46. The droughts of 1940 and 1943 reduced crops below average, and the three short crops forced the country to adopt rationing in 1946 after most countries were recovering from the war. The demand for foodstuffs in South Africa during World War II was due to the need for provisioning of convoys en route around the Cape of Good Hope. A large number of prisoners of war were also sent to this area to be fed from local supplies. The major part of the farm output continued to be in crops for home consumption. Corn is the most important grain crop, of which a part is exported to neighbouring colonies, as it is the principal food of the natives. Fruit exports to Britain were restricted by the shortage of shipping, except for dried fruits, which expanded in output. Sugar production was expanded about 30% after 1940. Production of meat animals was increased as rapidly as the feed supply would permit. Imports from Argentina were contracted for in 1946 to make up the shortages. The government raised the price of wheat to encourage planting. Had the droughts not intervened, the southern part of the African continent would have been well provided and would have made a much larger contribution to the war effort.

Australia.—Self-sufficient with respect to almost all foods for a considerable period, Australia was also the world's second largest exporter of foodstuffs during the prewar period 1935-39, second only to Argentina. Crop production did not increase rapidly, but exports were maintained in spite of the droughts, and rationing was introduced in order to conserve supplies for war uses. Early in the war, shipping was so scarce that the long haul to Britain was difficult, but with the outbreak of war in the Pacific there was immediate demand for all farm products that Australia could produce. Considerable quantities were supplied to the United States forces under reverse lend-lease. Other supplies were needed by the Allies in the Asia theatre of war. The two-year drought in 1943-44 was a serious set-back, cutting production to two-thirds of normal. Because of the small population of Australia the draft of men for military forces and war industries brought on an acute farm labour shortage which made farm expansion difficult. Machinery was also scarce and fertilizers in short supply. The result was a smaller production of cane sugar. Fresh vegetable output was increased to meet the demands of troops. The demand for meats increased, and pork and mutton output expanded. By 1943 there were 35% more sheep and lambs than in the prewar period. Milk was used as fluid milk and cheese, and the manufacture of butter was severely restricted. The greatest gains in exports in 1945 were in beef, veal and pig meats, while mutton and lamb were about the same as in the prewar period. Butter exports dropped off, although cheese shipments increased. The rice area was increased and the product was mostly exported to Pacific areas cut off from their normal source of supply.

New Zealand.—Before World War II, New Zealand was one of the best fed nations, and in many ways among the most prosperous agriculturally. It was a dairy and livestock island that exported large quantities of meat and dairy products and imported wheat, fruits, sugar and minor necessities. Splendid pastures favoured the livestock industries. Since it was mostly a pastoral country, expansion was not easy to accomplish without plowing up grasslands. A large increase in vegetable production was stimulated by the United States Joint Purchasing board to fill the military requirements of that area. Production, consisting mostly of lamb, mutton and beef, increased

about 10% above prewar averages. The best year was 1941, after which there was a decline in 1942–43 followed by some recovery. Wheat acreage declined in 1945 and 1946 because of low prices and bad weather at seeding time. Rationing was maintained in order to assure adequate supplies for export. The total value of exports from New Zealand in 1935–39 was almost equal to that of Australia and amounted to about 9% of total food exports, about the same as Australia. This was accomplished by a farm population of about 164,000 in New Zealand, compared with about 574,000 in Australia. Considering their total populations, these two countries were the most important agricultural producers in the world.

Continental Europe.-At the beginning of the decade 1937-46, the agriculture of most countries on the European continent was in an improving situation. The efforts of Germany and Italy to put their food production in order after the low years following World War I had brought good results. The production of central European countries was up to a fairly high level, and every effort was being made by Germany in particular to become self-sufficient. The "Battle of Wheat" in Italy had increased cereal production, and the introduction of U.S. seed corn into the Po valley gave promise of further increases. All of the reclamation efforts had added to the food supplies, although little was available from the African colonies. Italy's war efforts in Ethiopia and Spain had been a drain on her resources and had retarded her development-a handicap which Germany did not experience. The Germans were utilizing all the scientific aid they could collect by sending missions into other countries, notably the United States. In 1928 an American Study commission had surveyed Germany at the request of the German republic to suggest what was needed to regain the losses of World War I and the four years of inflation that followed. The recommendations of this commission were utilized by the succeeding nazi government along with all other aid it could assemble to plan for the expansion of agriculture in 1932-37. The potato crop of 1937 was reported at 2,032,-000,000 bu. compared with 1,681,000,000 bu. average for 1930-35. Barley production was 167,000,000 bu. compared with 144,000,000 bu. average. Beet sugar production was up to 2,436,000 tons in 1937 compared with 1,837,000 average before that year. Other crops had been increased likewise. During the first four years of the war, 1939-43, the axis countries overran the richest lands of the soviet union and western Europe, and were in command of an immense food supply. The blockade by the Allies was less important than the blockade of Britain by axis submarines. The soviet union, which was about self-supporting at the outbreak of the war, lost its breadbasket with the German invasion and was in a serious situation. The soviet surplus was found to be much less than generally supposed and the loss of 40% of its best grain land deprived the soviet armies of sufficient supplies. The beginning of lend-lease shipments from the United States were directed to the armies and war workers.

The axis countries lost some of their imports of livestock feeds and reduced the numbers of animals accordingly, but on the whole the reduction was less than expected. Plans for rationing the civilian population according to age and type of work were planned before the war and favoured the armies and essential workers. By shifting consumption to those involved in the war and reducing the poorer and oppressed classes to mere subsistence, the food supply was made to meet all needs. The axis policy, to keep the

farmers on conquered land producing at normal levels, was followed in the Ukraine, the Balkan countries, Denmark, France and Norway. The Germans moved farmers and machinery into some areas to increase production. Elaborate plans for the consolidation of all European agriculture under German leadership had been carefully worked out before the invasion of Poland. Able-bodied men were taken from the farms, and most of the farm work was done by the old men, women and children. At one time it was estimated that 90% of the farm work of the soviet union was being done by these classes.

 Λ great shortage of food and other agricultural products developed in Europe after the intense bombing campaigns of 1944 by the Allies. The destruction of cities, railroads, storage centres, etc., destroyed the surplus stocks and prevented the gathering of crops from the farms. The city populations suffered while the farmers were relatively in about the same position as before the war. The farm labour, machinery, fertilizer and seed supplies were smaller, yet most rural people had better subsistence than those in the cities. U.N.R.R.A. and other relief activities were chiefly confined to the cities after the end of hostilities. The year 1944 was the lowest in food supplies, with 1945 and 1946 showing improvements. The soviet armies recovered the Ukraine by the middle of 1944 and began to restore production. About 65% of the crop area was planted in 1944. France showed an increase in 1944 and much more in 1945. In the Netherlands and Belgium the 1944 campaign retarded recovery and it was not until 1945 that any material improvement was recorded. Germany had a poor potato crop in 1944 and began to feel the pinch for lood. Most of the supplies of Italy were taken by the Germans, leaving Italy very short of supplies. Altogether Europe was estimated to have only 85% of its prewar supplies, mostly in the hands of producers; the cities were very short in reserves.

The year 1945 brought the farm production of Europe

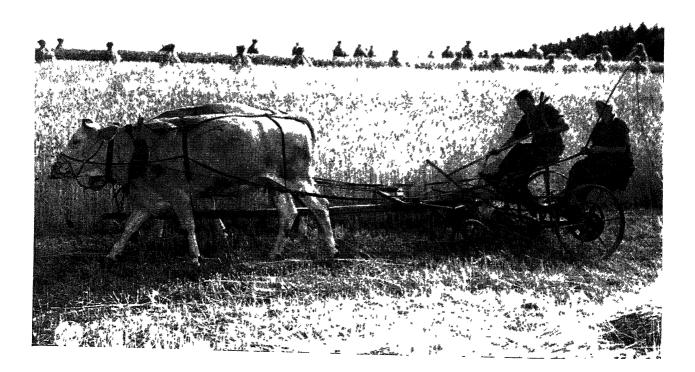
as a whole to the lowest state of the war, because bad weather and the final campaigns of the Allies followed a severe winter. The drought that swept all the Mediterranean basin reduced grain and pasture production. The Danube basin area was in a political turmoil which retarded all activities. Germany was breaking down, and the Low Countries were just beginning to recover. Broad estimates based on the scanty statistics available placed German agriculture at the low point of the century, perhaps 25% below prewar. Yields were down 20% to 25% and acreage 10% to 15%. Stocks were almost exhausted, and imports were wholly cut off. By the fall of 1945, planting in Europe began to recover and in the U.S., British and French occupation zones relief to farmers of seeds, machinery and fertilizers began to increase. The situation in the soviet zone was not fully reported but appeared to be improving. Livestock production was below prewar in all zones of Germany. Total agricultural production was estimated at about 25% below the prewar average. The 1946 mid-summer reports indicated that crops in 1946 would bring the level up to about 80% of prewar average.

Finland was about 20% short of being self-supporting in the prewar years. The Russian invasion of 1939 reduced the crop and livestock output sharply. Then the difficulties of getting imports increased and average consumption dropped about 25%. In 1944, when Finland gave 10% of her crop area to the soviet union while retaining her entire population, the situation was made much worse. The outlook in 1946 was for slow improvement until trade could be resumed that would assure imports.

Sweden was about 90% self-sufficient in 1937 even with sugar. As feed imports were cut off by the war, meat exports ceased. By careful rationing the food shortage of about 12% was controlled, and such products as milk, potatoes and vegetables remained unrationed.

Norway suffered greatly during the period of occupa-

German farmers reverted to primitive methods of agriculture after Germany's defeat, to compensate for lack of machinery and horses. Here a farmer and his wife are shown harvesting wheat with a pair of oxen near Honad, Germany



tion by the Germans. Only about 43% of its food had been produced within the country, supplemented by imports and fisheries. When the Germans limited the fishing and foreign trade became impossible, the shift was to a vegetable diet. Meat production stopped and only fish was eaten. Potato production took the place of grains. The recovery was proceeding slowly in 1945 and 1946 while fishing was being restored.

North Africa and Middle East.-North Africa exported considerable agricultural products up to 1942 and then with Allied invasion shifted to an importing region. The crops of 1942-45 were below average, and even good crops in 1946 were not expected to put the area on an export basis, since the population had increased from 16,000,000 in 1936 to more than 20,000,000 in 1945. The entire middle east had small surpluses after 1940 and was recovering slowly in 1945. Palestine, as usual, had to import heavily to support its rapidly growing population, which increased from 1,300,000 in 1935 to 1,800,000 in 1945, or $46\frac{67}{10}$ in 10 years. The usual exports of citrus fruits ceased during the war. The 1945 crop was estimated at 8,200,000 cases, of which 6,200,000 cases were available for export. The agricultural development of this country was at a standstill through 1946 because of the disturbed political situation. Until there was more irrigation the resources of the country would continue short of needs. Over the near east, Egypt, Turkey, Iran, Iraq, the agricultural situation was less disturbed than in Europe and was nearer to the prewar level in 1945 than elsewhere in the Mediterranean basin.

Soviet Union.—The agriculture of czarist Russia had produced a large volume of exports which gave the nation a leading place as an exporter of farm products. Following World War I and the subsequent revolution, the economy of the country was so disturbed that recovery was slow and the output of crops and livestock yielded little for export. By 1937 the production of livestock was still below the level of 1928 although the population of the country had increased about 10%. The country was about self-sufficient but on a low level of consumption. The German invasion of 1941 struck at the best agricultural region of the country, and about 40% of the best crop area became a battlefield. In 1941 and 1942 the soviet union lost control of its best wheat, sugar beet and oilseed areas. Much of the machinery introduced under the system of collective farms was located in these fertile areas, and much of it was lost. Reported losses included 137,000 tractors, 49,000 combines, about 2,000,000 plows and other small instruments. Great damage was done to seed and animal-breeding stations, sugar mills and transportation facilities. Livestock losses were heavy, although the soviets moved as many as they could to other areas. The manpower of the area was reduced by army drafts and the shifting of men into Germany as prisoner labourers.

The production of the area was maintained to some extent by the old men, women, children and town people. The Germans favoured the production of food crops and moved in tractors and other machinery to some areas. Yields declined and the soviet food supply could not be maintained in the uninvaded regions. Lend-lease shipments by the Allies, mostly by the United States, in fats and oils was equivalent to half of the 1938 production. Meats shipped were equal to one-fourth of soviet production; other foodstuffs not usually produced there were also received. These supplies went to the armies almost entirely, and the civilian population had a very small ration. Rationing was graduated according to work done, ranging from 800 calories for dependents to 1900 for war-workers.

All who had the opportunity could supplement these rations from garden plots or by purchases in the free market, where prices were high. Some of these free markets were operated by the government. Prices for the two markets showed fantastic differences, viz., butter under the rations \$2.17 per kilo (about two pounds) compared with \$66 per kilo in the free market; beef \$1.17 under ration and \$33 free; sugar 46 cents per kilo rationed and \$75 free; black bread 8 cents rationed and \$12.50 in free market. This was at the time the dollar was exchanged for 12 rubles.

As the German armies were driven out of soviet territory and the red army advanced into other areas, the food supply was gradually increased. Planting in the U.S.S.R. proper, as well as in adjoining areas, was increased. The gains were slow, however, because of the lack of machines, animals, fertilizers and seeds. Available statistics for 1945 and 1946 indicated that in 1945 about 70% of the prewar acreage had been planted to crops in invaded areas. The official plans for 1945 called for increases in grains, indicating that the soviet government was planning to bring grain production up to the prewar level as quickly as possible, while beets and cotton were to be increased slowly. Considering the low levels of consumption still existing, it seemed unlikely that soviet food production would be back to the prewar level until two or three years later, and that export surpluses would be small for at least five years. Some shipments of grain were made in 1945 and 1946, but these were not used domestically. With the growing population, greater industrialization and demand for better living by the people, it appeared unlikely that the soviet union would become an important factor in world trade except as exports were needed to get exchange to buy scarce raw materials. The extent to which the nation might be self-sufficient for industrial development was as yet unknown.

Asia.—War was well under way in the far east during the first year of the decade, particularly in China. At first the invasion of China by the Japanese did not affect agricultural production as might be expected. China as a whole was always short of food supplies in some areas, as floods, droughts or other disasters destroyed crops. Famines and acute shortages were common because of the lack of adequate transportation facilities to move the surpluses of one area to the areas of shortage. In the 22 provinces for which scarcity reports were available, a crop of wheat larger than that of the United States was produced as well as twice as much rice and immense amounts of other crops for which no reports were available. Most of the immense population subsisted on what could be grown locally. As the war progressed, crop failures and continued military requisitioning by the invaders aggravated shortages. Free China made vigorous efforts to maintain production by distributing seeds and other materials, but these aids touched only a small part of the farm population. Gradually the total food production of China fell below that of the prewar years. Supplies shipped in by air "over the hump" from India could not be large. Military supplies were so important that until after the surrender of Japan the amount of agricultural supplies shipped was small. While the total of lend-lease aid to China exceeded \$1,335,-000,000, very little of this amount was for agricultural improvement. Lend-lease aid was continued to China after it had been officially terminated to other countries. An increase of imports in 1946 was expected if stocks could be found in the far east.

A long-time improvement of agriculture was undertaken by the national government. Agricultural experts from the United States and Britain advised the small but growing body of Chinese trained in agricultural science. A broad plan of agricultural education and extension was planned. Progress depended upon the return of peace and the development of transportation facilities—the greatest single need of China.

India.-Perpetually in short supply of food, India had been on the verge of famine before 1937. With the steady growth of population, the outlook was dark even before World War II brought new troubles in the form of the loss of the small quantities of imports which were of vital importance to the larger cities. While only about 3% of the total grain supply was imported, the total was so large that it was of considerable importance. When the Japanese cut off the rice supplies in southeastern Asia, the government of India began a program to increase food production by devoting more area to food crops. About 5,000,000 ac. were diverted from cotton to millet and about 1,000,000 ac. from jute to rice. Double cropping increased the food area by about 3,500,000 ac. Total supplies were not sufficient to maintain prewar consumption even at the low levels of that period. The constant pressure of increasing population kept production at the maximum of the ability of the people under existing methods. Any increase had to come from a radical change in agricultural practices or from some increase in industrialization to make products that could be exchanged for imported foodstuffs. The agricultural problems of India were unique in the world's agriculture and were a challenge to the scientists and statesmen alike. The war uncovered no promising solution except possibly the hope that a new form of selfgovernment might show the way toward improvement.

Japan.—Japan imported about 20% of its food supply in prewar years. The excuse for the invasion of Asia was the need of more land. Until 1944, the Japanese homeland got supplies from Manchuria and China to meet the requirements for her armies which did not live off the countries they had invaded. There was no serious food shortage until near the time of surrender, when shipping became limited. By 1945, the domestic supply was about 22% below prewar, and population had continued to increase. Foreign sources were cut off, and arrangements for trade were needed to provide for the future. After V-J day, U.S. military government co-operated with the local governments to open such trade channels. American cotton began to arrive in Japan early in 1946, and the textile mills reopened. Shortage of coal, however, delayed the complete reopening of industries. For future food supplies Japan looked to China, Manchuria and Indo-China, where there was sufficient surplus production to meet her

The great area of southeastern Asia where rice is the principal agricultural product was still producing below the prewar level in 1946. Small quantities of rice were available for export. Sugar shipments from Java were still small in mid-1946 because of political disturbances. Burma had small prospect of rice exports in 1946, although more than 3,250,000 tons had been exported on the average in 1935-40. The principal effect of the war in the southeastern Asia area was the disturbance of the normal marketing channels. Siam and Malaya reported the same shrinkage in the rice crop as did the neighbouring countries. All of these tropical countries with their large populations were showing their power to recover quickly in 1945 and 1946.

The permanent destruction by war was relatively small. (See Agricultural Research Administration; Census Data, U.S.; Chemurgy; Commodity Credit Corporation; Famines; Fertilizers; Horticulture; Irrigation; Law; Livestock; Meteorology; Price Administration, Office of; Prices; Soil Erosion and Soil Conservation; United Nations Relief and Rehabilitation Administration; Vegetables, etc.; also under principal agricultural products.) (J. C. Ms.)

Agriculture, U.S. Department of

See GOVERNMENT DEPARTMENTS AND BUREAUS.

Airborne Warfare

See TACTICS OF WORLD WAR II; WORLD WAR II.

Air Conditioning

Although air conditioning applications had started about 1912, they were primarily of the industrial type as used in textile mills, until the introduction of comfort air conditioning in theatres about 1925. The application of air conditioning to small commercial establishments was very limited until about 1932.

The relative lateness of development of air conditioning for comfort as contrasted with air conditioning for industry may be explained by a number of factors such as the need for suitable refrigerants, the need for compact, lightweight, inexpensive equipment, a more difficult economic justification and the need for adequate distribution facilities.

The introduction about 1932 of the refrigerant dichlorodifluoromethane, "Freon-12," nontoxic and noninflammable, permitted the development of direct expansion systems in place of indirect systems which had previously been required for safe operation. This eliminated the necessity of water chillers, water pumps, spray chambers and expensive machinery rooms for the small commercial type of applications. It also permitted better over-all efficiency, lower operating cost, and lower maintenance cost.

Installations of air conditioning in 1937 were at least 700% of those in 1932. During the remainder of the decade 1937–46, installations levelled at a rate somewhat lower than the 1937 peak. At least 60% of all air-conditioning systems in operation by the end of 1941 were installed in the five-year period starting in 1937. Installations after 1941 were at a lower rate because of World War II.

Estimates compiled by Edison Electric institute for territories served by 150 electric utilities in the U.S. indicated a total of 81,978 installations at the end of 1941 (21,673 residential, 47,650 commercial, 4,759 industrial, 7,896 miscellaneous). Bureau of census statistics of shipments for 1940 and 1944 showed components of air conditioning systems and self-contained air conditioners in reasonable detail. Statistics for other years were not detailed enough to be of much value.

Room air conditioners of the self-contained air-cooled type increased from a negligible quantity to 19,205 in 1940 billed by manufacturers at \$3,438,775. There was no manufacture during the war years. Commercial air conditioners of the self-contained type introduced in 1937 increased to 5,880 in 1940, billed by manufacturers at \$4,466,926. Although production continued during World War II for essential applications, the rate was less until 1945.

Equipment.—The basic components of air conditioning systems, such as compressors, condensers, air conditioners and controls were simplified and made more efficient and reliable in operation during the decade 1937-46. In

addition, several new types of air conditioners and air conditioning systems were developed.

Reciprocating type refrigerant compressors, used in small and intermediate size air conditioning systems, were changed in many respects during the decade. Maximum speeds were increased from a range of 400 to 600 r.p.m. in 1937 to a range of 900 to 1,720 r.p.m. in 1946, and a few applications were made at substantially higher speeds. There was an extension in the use of multi-cylinder compressors of line, V, W and radial type, freer of vibration and more compact than the older types. The older designs which had suction and discharge valves in the piston were supplemented by designs having these valves in a valve plate at the top of the cylinder, permitting smaller clearance volume with lower operating cost and better accessibility for maintenance. Several types of modulating devices were developed to permit the operation of compressors under partial load conditions.

Centrifugal refrigerant compressors, used in the larger air conditioning systems (75 to 1,500 h.p. range), were also greatly improved in efficiency and reliability. The original designs were developed in Germany, but by 1946 the greatest number of manufacturers and the greatest amount of production was in the U.S. Switzerland, Germany and Japan were the only other countries where this type of equipment had been produced.

Condensers of air and water and evaporative types improved in performance, but did not change in general type. Water-cooled condensers were made in special alloys, such as copper-nickel, aluminum alloys and bronze for marine applications, using sea water for cooling.

Air conditioners of the central plant type, with spray chambers or heat transfer coils or a combination, changed little in general character. Room air conditioners of the self-contained type, on the other hand, changed radically. Up to 1937 the few that were sold utilized water-cooled condensing units which required water piping and water drain connections. Later, air-cooled types were introduced, mounted in or in front of a window, permitting the discharge of heat extracted from the room to the outside air, and the evaporation of moisture extracted from the room air into the outside air. The introduction of these types greatly simplified installation problems, reduced the cost and broadened the market.

Air conditioners of the self-contained type used principally in commercial applications were also developed and introduced about 1937. These units, originally of three h.p., were extended in size from one to 25 h.p. They were complete air conditioners with self-contained condensing units requiring only connections for water, electric wiring, water condensate, drain, and in some cases air ducts for air delivery. These reduced application and installation costs.

Two types suitable for air conditioning multi-room buildings, such as hotels and office buildings, were also developed and introduced. Both utilized individual room air conditioners of the cabinet type or built into an enclosure under the window of a room, and a central plant refrigerating system for refrigerating cold water circulated in pipes from a basement or roof location to the individual room air conditioners. In the first of these types an electric motor was used in the room air conditioner to circulate air over the cooling coils, and ventilation air was drawn through an opening in the wall or through a separate ventilation air duct. In the second type, a primary air conditioner was located in the machinery room to condition the ventilation air, which was supplied under relatively high pressure (of the order of six in. water gauge)

to an air nozzle in the room air conditioner. The latter induced the secondary flow of air from the room over the cooling coils.

Railway air conditioning systems were extensively developed during the decade 1937–46 in two main types, the reciprocating compressor type and the steam jet type. The latter, using steam from the locomotive, found widespread application, but later decreased in relative importance, partly because of maintenance problems when a cooling tower was used for condensing the steam. The reciprocating compressor types, in contrast, used air-cooled condensers and appeared to be gaining in relative importance. The drive preferred was electrical, in which electricity was generated from the axle, but mechanical drives from the axle and gas engine drive were also used.

Steam jet and absorption types of refrigerating systems were developed and used in commercial and industrial systems where central station steam lines or waste steam in processes were available. However, in general, these systems could only be justified where part of the cost of the steam required was absorbed by requirements for building heating, manufacturing processes, etc.

Applications.—Comfort air conditioning, which got its start in large theatres about 1925, was extensively applied in a variety of other applications during the decade 1937-46. Commercial establishments using air conditioning extensively included department stores, five-and-ten-cent stores, small stores, restaurants, amusement places having eating facilities, multiroom buildings, theatres, passenger cars, busses, passenger ships and aeroplanes. Residential applications also started during this period.

Industrial air conditioning likewise received great impetus during the decade because of production requirements brought on by World War II. In addition, special forms of air conditioning were used for strictly wartime applications. Industrial air conditioning was used in the storage and processing of materials, in precision manufacturing, in laboratories, in testing, and for work efficiency, health, comfort and safety for personnel in manufacturing plants. Air conditioning was particularly extensive in the very large windowless blackout type buildings built during the war for aeroplane manufacture, particularly in the U.S. It was also extensively used for engine, supercharger and intercooler testing, for refrigeration of wind tunnels used in testing aeroplanes and to simulate flight conditions for the testing of matériel and personnel. The latter application included development of stratosphere chambers to simulate high altitude conditions.

Military requirements dictated the extensive use of air conditioning for bomb sight installation, repair and calibration; special buildings for celestial training, Link trainer buildings; for the storage of wool flying suits; in parachute drying and storage; in airport control towers; aeroplane engine testing buildings; photographic development rooms and mobile units; in radar rooms, powder magazines, ready rooms for aviators, and other special applications aboard ships, also in armament, instrument inspection and adjustment, in armament fire control buildings, plotting rooms, operating rooms and convalescent rooms in military hospitals, hospital ships and hospital cars and portable food refrigeration units.

Distribution.—Approximately 85% to 90% of all air conditioning equipment in 1946 was installed in the U.S. The balance had been applied principally in Central and South American countries, India, China, the East Indies, Cuba, Mexico, Canada, and to a limited degree in France,

Germany, Italy, Belgium, Great Britain and others.

The large types of comfort air conditioning systems and most of the industrial systems had been sold direct by the larger manufacturers and by general contractors. The small commercial type systems were sold principally through distributors and dealers, most of whom had entered this business after 1937.

Many of these were exclusive air conditioning distributors; others combined this business with commercial refrigeration, residential heating, residential insulation and other types of businesses.

Standards.—The rapid growth of the air conditioning industry resulted in the development of a number of standards during the decade covering application, installation, rating and testing and safety requirements. Joint committees for rating commercial and industrial refrigerating equipment, sponsored by the American Society of Refrigerating Engineers, developed a series of rating and testing codes.

The National Fire Protection association developed a code on air conditioning, published by the National Board of Fire Underwriters as pamphlet No. 90.

The American Standards association developed project B-9 "Safety Code for Mechanical Refrigeration," including refrigeration in air conditioning. Minimum equipment standards were also developed by other groups such as the Air Conditioning & Refrigeration Machinery association and the division of trade standards of the U.S. department of commerce.

(See also Public Health Engineering.)

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Aircraft Carriers

See Aviation, Military; Navies of the World.

Air Forces

See AVIATION, MILITARY.

Air Mail

See Post Office.

Airplanes

See Airports and Flying Fields; Aviation, Civil; Aviation, Military.

Airports and Flying Fields

The wide variety of types of aviation activities during the decade 1937–46—scheduled air transport operation, manufacturing and testing, military and naval combat flying and training, charter operations and personal flying and training—each had its own special requirements and standards of safety which were reflected in the aircraft and consequently in the airports designed to accommodate the particular activity.

By 1946, scheduled air transportation was using aircraft twice as heavy as those in use in 1937. Still heavier aircraft were yet to come, so that airport progress had to be measured in weight capacity as well as landing field size. The story of airports for the decade was that of trying to catch up with the widespread increase in use of air craft and their growth in speed and weight.

U.S. Airports.—In 1937, there were 2,299 U.S. airports recorded by the bureau of air commerce. Approximately 75 were owned and operated by either the army or navy, and the remainder were civil facilities.

About 10% of the total was used as terminals for the air lines and the remainder served the needs of personal flying.

At the beginning of the federal relief programs in 1933, public airport improvement or construction projects had been made eligible for federal assistance; through these programs a serious start was made to provide the facilities required by the expansion of the air transportation system and the improvements necessary to accommodate the transport aircraft coming into widespread use. Federal assistance to airport construction took the form of a labour contribution with the sponsor supplying the funds necessary for the materials and equipment.

Because of the national importance of uniform standards of design and construction to such a large program, the bureau of air commerce was made responsible for the approval of all airport improvement projects receiving federal aid. It was during this period that the bureau began the compilation of a national plan or outline for airport construction in the U.S. The purpose of this plan was to provide a correlated pattern of airports based on the requirements of civil flying, air transportation and national defense. The latter item was becoming increasingly important because of the small number of permanent military and naval airfields and the growing realization of the predominant part that air power would play in war.

Future aircrast, both civil and military, were put into the design stage at the beginning of this period, and it was becoming clear that the airports which were being built through the relies programs would not be adequate.

In 1938 the Civil Aeronautics authority (CAA) was created by congress. This act brought together into one organization the various agencies of the federal government which had to do with the encouragement and regulation of civil aviation. In the following year, several proposals were made in congress for specific legislation authorizing direct federal assistance to public agencies sponsoring airport improvement or construction. During this two-year period, 1937–39, the total number of airports recorded by the CAA decreased from 2,299 to 2,280. However, through the assistance of the Work Projects administration the over-all quality of the airports which remained available was improved.

International developments began to increase the urgency of airport development. The value of products of the aircraft industry in 1937 was \$114,092,601, of which \$39,404,469 represented the value of exported products; in 1939 the total value was \$247,904,863, of which the export proportion was \$117,807,082. In two years the volume of aircraft manufacturing had doubled with a corresponding effect on the use of airports as these aircraft were tested, flown to various destinations and placed in use.

Military and naval aviation received their first small authorizations for increased size and the implications of the future were becoming clearer. At the beginning of 1940, planning conferences were held between military and civil aviation officials to consider the most effective ways of expediting the airport construction necessary for the expanded military air forces. Because of the small



La Guardia field, New York city airport at North Beach, opened in Oct. 1939. Equipped with a 6,000 ft. runway, the airport was built at a cost of \$40,000,000

number of permanent military and naval air installations, civil airports constituted the base for the expansion of the service installations. Expansion and improvement of the civil airports would also have the effect of providing improvements badly needed for the expansion of air transport operations. Accordingly, it was determined to undertake a co-operative program of airport construction with the CAA providing the funds for those improvements which could be justified from the standpoint of civil aviation, and the military and naval services supplementing these funds for additional improvements to civil airports and, of course, constructing their own facilities where no future civil use was evident.

This program was accepted by the U.S. congress, and the first appropriation of federal funds in the amount of \$40,000,000 was made available to the CAA in Oct. 1940. The projects to be undertaken initially were selected and approved by the war and navy departments, and the first construction was begun in Dec. 1940.

The War Years.—As might be expected under conditions of war, U.S. civil flying other than scheduled air transport was extremely limited during World War II. At the outset of war many private aircraft were purchased by the government for pilot training or routine use by the army or navy. The number of transport aircraft in operation was reduced by requisition and purchase by the government from 453 in 1941 to 254 in 1942, and some certificated air routes were suspended for the dura-

tion of the war. The types of military and naval aircraft and kinds of operations became many and varied, each with its own special airport requirements. Expansion of the army and navy air forces immediately prior to and following the entry of the U.S. into the war required a great acceleration in the rate of airport construction.

The number of aircraft produced in 1940 was more than twice that of 1939, and the 1941 rate again was more than twice that of 1940. These were almost all military aircraft which had to be test flown and delivered to their destinations either in the U.S. or other parts of the world. Most of these activities took place on existing civil airports, and the ferrying of the aircraft was channelled over the civil airways system with the result that the airports began to receive extremely heavy traffic both in plane movements and in increased aircraft weight.

While the war activities required that airport construction be greatly accelerated, its principal effect was shown in the design of the fields themselves from layout to pavement load capacity. Increased traffic at major airports caused apparent design deficiencies in taxiways, apron sizes and runway layouts which limited the capacity of the port in aircraft movements; in addition, much of the paving which had been designed to support gross loads of 15,000 to 20,000 lb. with unlimited use, or 30,000 to 40,000 lb. with restricted use, began to fail.

The standard gross weight of the Douglas DC-3, which was used almost exclusively by U.S. air lines before and during World War II, was 25,200 lb. By 1942, training activities and transport and cargo operations were being conducted with aircraft weighing three times as much as



Northwest field, U.S. base on Guam for B-29 superfortresses, was put in operation June 1, 1945. From here the big planes took off to bomb Japan. The 8,500-ft. runway and the more than 200 hardstands were constructed of asphaltic concrete. Ten battalions of U.S. aviation engineers and seabees built the field in three months

a DC-3, and it was only a short time later that the very heavy bombers began to appear, operating under gross loads in excess of 100,000 lb.

Apart from the production of aircraft, the principal flying activity in the U.S. during the war period was the training of pilots and crews for action overseas. This alone was a prodigious undertaking, requiring not only the utilization of every suitable airport, but also the construction of hundreds of additional facilities, each group particularly designed for the special activities involved.

The flight training programs of the U.S. armed services faced a problem of high production with the maintenance of a high standard of quality and involved not only pilots but also navigators, bombardiers, flight engineers and gunners.

Airports for light aircraft had to be provided near the

colleges which were the centres for student traming, the first step in the air training program, where the student received 10 to 15 hr. of light plane flight time. Primary, basic and advanced training stations all had to be supplied with airports increasing in size and facilities as the training became more complex and the aircraft approached combat types. Training in flight as distinct from flight training had to be provided for other specialized airmen such as navigators, bombardiers and gunners, and the schools where they were trained had to be served by airports at the main base and auxiliary bases. Airports for gunnery schools, bombardment ranges and many other specialized uses had to be developed either through the CAA program or by direct army or navy construc-

In the final stage of training, the various crew members were brought together and trained as a unit in the type of aircraft they would use in combat. Thus, all types of aircraft from light artillery reconnaissance planes to superfortresses were flown extensively to and

from airports in the U.S., and adequate facilities for such operations had to be provided.

The need for special supplies, equipment and expert personnel at the many battlefronts all over the world was fulfilled by stepping up the transport services of the army and the navy. Some of these services were operated by several air lines under contract to the army and the navy while others were conducted directly by the armed forces. Vast amounts of cargo were handled by these operations, and the technique of cargo transport was greatly improved. Because of the nature of these operations, requiring scheduled operations over main and branch lines of supply, the airport and building requirements for cargo and freight hauling by air became apparent.

While all airport construction during this period was essentially for war purposes, the fundamental principle of the CAA defense airport construction program was to provide war facilities capable of conversion to civil uses in peacetime. This program, while not large, compared to many war expenditures, embraced more than 500 airports and resulted in an expenditure only slightly under \$400,

ooo,ooo in federal construction cost. In this program, municipalities were required to furnish the site, clear obstructions and provide utilities and access roads; the federal construction was limited to improvement of the site, and no CAA funds were used for airport buildings. Problems encountered under this program in the location of suitable sites, conflicts with existing airports and air traffic patterns and objections of surrounding property owners to airport establishment all pointed clearly to the necessity of emphasizing the importance of the community planning of airports if the expected postwar increase in civil flying was to be obtained.

The volume of aircraft operations and the development of specialized types of aircraft for specific tasks all contributed to the realization that only in lightly populated areas and smaller cities could all types of flying be accommodated on one airport without creating hazardous flying conditions. Faced by these problems, many of the larger communities in 1944 and 1945 began the studies necessary to provide the basis for development of a regional plan for airports. Such undertakings were complicated by the many types of political subdivisions in the major metropolitan areas, each having, in many cases, the authority to construct and operate public airports. Minneapolis and St. Paul, Minn., were the first to recognize the potential dangers in permitting uncontrolled airport establishment in a metropolitan area and to take effective measures to control such development.

In 1943 the legislature of the state of Minnesota authorized any two contiguous cities of the first class to establish a metropolitan airport commission which could acquire and control all airports and air-navigation facilities within the area specified. In addition, the commission could tax and expend the funds so acquired for the acquisition, maintenance, operation and construction of airports in the area, including necessary air rights over private and public property and the planning, investigations and studies essential to its operations. Thus the metropolitan area was equipped to control the construction of airports and work such developments into the community plan. In addition, the airport plans could be correlated with other plans for highway, road and street improvement. Finally, and most important, the commission through its power to raise funds by taxation and borrowing, was in a position to effectuate its program independently.

Early in 1944, the U.S. house of representatives requested the CAA to conduct a survey and prepare a report on "the need for a system of airports and landing areas throughout the United States," together with such recommendations for legislation as may be needed. The report requested was submitted in Nov. 1944 and early in 1945, after various bills following the legislative recommendation of the CAA had been submitted to both houses of congress, hearings were held on proposed legislation authorizing federal aid in the development of public airports along the lines of the successful federal aid highway program.

The Postwar Period.—The end of the war in Europe and later the surrender of Japan in the Pacific resulted in the elimination of most of the restrictions on U.S. civil flying which had been in effect after 1942. Resumption of private flying, with the return of many veterans and the sale of war surplus aircraft, encouraged the establishment of new airports and the reopening of many small ones. During the first six months of 1946, the increase in the number of this type of facility amounted to 16%.

In April 1946, congress approved a program of direct federal aid for the construction or improvement of public

airports, and it was expected that this assistance would supply the impetus necessary to obtain the airports necessary for vast expansion of civil flying.

The Federal Airport act authorized total appropriations amounting to \$500,000,000. The appropriation for any one fiscal year might not exceed \$100,000,000. Of the funds appropriated under this authorizing legislation 5% was to be retained by the CAA for the expense of planning and administering the airport construction program. The remaining 95% was divided into two funds. One, amounting to three-fourths of the 95%, was to be apportioned among the states in proportion to their population and area, the other was a discretionary fund to be allotted to specific projects which the administrator of CAA deemed most appropriate for carrying out the national airport plan. The act further authorized appropriations totalling \$20,000,000 for airport construction in Alaska, Hawaii and Puerto Rico, of which 50% was to be used in Alaska and 25% each in Hawaii and Puerto Rico.

In general, the act authorized the use of funds appropriated for land and easements in air space, for airport construction including the removal of hazards, and for the construction of airport buildings except hangars. Other provisions set the proportion of federal participation in the various items of work, classes of projects and locations of the projects. Some states also appropriated funds with which to assist public sponsors in the state in meeting the basic federal participation ratio of 50% to 50%. That this assistance would be necessary in maintaining adequate airport capacity for the expansion of both scheduled and non-scheduled flying was forecast by the rapidity with which the air line operators put into service larger aircraft such as the Douglas DC-4 and DC-6, Lockheed Constellation and Boeing Stratoliner, having gross weights in the 60,000 to 80,000 lb. range.

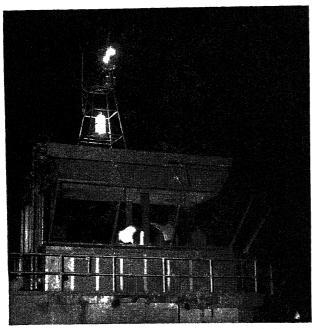
Many of the airports used by aircraft of this type and weight had their runways, taxiways and aprons improved during the war sufficiently to withstand the gross loads. However, there still remained a number of points generating sufficient traffic to warrant large aircraft service with airports insufficiently developed to handle these planes; a heavy proportion of civil airports serving the major cities could not stand frequent use by aircraft of the Lockheed Constitution, Douglas Globemaster, Consolidated CV-37 and Boeing Stratocruiser type, having gross weights between 130,000–320,000 lb.

The CAA continued to classify airports according to the effective lengths of the area available for take-off or landing. Class 1 airports had to have, at sea level, a usable landing strip of from 1,800 ft. to 2,499 ft. in length; class 2 from 2,500 ft. to 3,499 ft.; class 3 from 3,500 ft. to 4,499 ft.; and class 4 from 4,500 ft. upward.

There follows a comparison of the number of airports in the U.S. by classification for the periods discussed previously:

	J an. 1, 1939	Dec. 1, 1945	July 1, 1946
Class 1	1,693	1,550	1,797
Class 2	424	1,054	1,178
Class 3	57	479	488
Class 4		834	843
Total	2,174	3,917	4,306

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Control tower of the National airport at Washington, D.C., most modern in the world at the time of the airport's opening, June 16, 1941. Radio receivers were provided for each air line using the field

H. O Sharp, Airport Engineering (1944); U.S. Civil Aeronautics authority, Airport Design (1944). See other publications of the CAA. (J. B. BD.)

Other Countries.—At the outbreak of World War II, all civil aerodromes in the countries involved were, for practical purposes, taken over for military use; civil flying was drastically reduced and controlled for the purpose of the war. Great programs of aerodrome building were introduced by all the belligerent countries. In Great Britain, where there were 150 aerodromes in 1939, there were approximately 600 when the war ended. The same degree of increase took place in almost every other European country belonging to or controlled by the major powers.

In 1937 and up to 1939 and 1940, aerodromes were generally grass-surfaced, or had a sandy or other natural surface according to the part of the world where the aerodrome was situated. Soon after the outbreak of war, the increase in size and weight of bomber aircraft and the need to be able to operate in all kinds of weather brought about the introduction of hard runways; this was a most important change in aerodrome layout. These runways were of concrete or some other form of hard surface, and were laid out in strips in two, three or more directions on the aerodrome according to the general meteorological conditions of the place. Up to 1939, a runway of 800 to 1,000 yd. on a grass-surfaced aerodrome was ordinarily sufficient; by the end of the war aerodromes used by heavy bombers had hard runways of 2,000 yd. for the main runways and only slightly shorter for the others. By 1946, on the main great terminal aerodromes being built in Great Britain and France, the principal runways were planned to be 3,000, 4,000 or 5,000 yd. long and the other runways 2,000 or 3,000 yd. A major problem regarding runways was the pattern in which they should be laid out. In 1944, there were two schools of thought: one favoured a series of parallel runways in perhaps three different directions which together built up two or more triangles, while the other preferred what was called the tangential system, in which the aerodrome buildings were situated roughly in the centre of a circle from which the runways were laid

out as tangents. The number of runways which could be built on either system depended upon the area of ground available and the limit to the cost incurred. The choice between these two methods was guided by the meteorological conditions of the site; the former was the better where weather would be bad for a large part of the year and the latter more suitable where almost continuous good and clear weather could be expected.

World War II brought about rapid development in radio and radar aids to air navigation and in the homing and safe landing of aircraft in bad weather and low visibility. This development also necessitated very long and wide, hard runways in the adaptation of navigational aids to civil flying. The Provisional International Civil Aviation organization drew up the following table of minimum lengths and widths of runways for various classes of civil aerodromes:

											٧	∕idth			
									Len	gth	Blind	Landing	Width Normal		
				CI	as	s			Feet	Metres	Feet	Metres	Feet	Metres	
Α									8,400	2,560	300	91	200	61	
В									7.000	2.134	250	76	200	61	
ō	i	·		·					5.900	1.798	200	61	150	46	
Ď									5.000	1.524	200	61	150	46	
Ē	·		-		-				4,200	1,280	200	61	150	46	
F	•	·	•		·				3.500	1.067	200	61	150	46	
Ġ		·		·	Ċ	Ċ			3.000	914	150	46	120	36.6	
	•	•	•	•	•	•	•		3,000	914	150	46	100	30.5	

Aerodrome costs rose steadily through the years 1937-46. In 1937, an expenditure of £500,000 was thought to be high for a first-class aerodrome, but in 1946 the estimates for big terminal aerodromes were £10,000,000, £25,000,000 and £50,000,000.

From a fairly simple civil engineering task in prewar years, the problem of planning and building a major airport became an engineering operation of the first magnitude. The acreage of land to be prepared in the case of the major airports rose from 750 or 1,000 ac. to 4,000 to 6,000 ac., and the numbers and sizes of aerodrome buildings, access roads and other aerodrome works increased in proportion.

During World War II, much use was made of steel meshing and steel plates which were joined together and laid on the ground to give a reasonably hard or resistant surface for landing. This device was specially used in the desert, on sea shores and on other sandy or soft surfaces; it was a cheap and efficient device, capable of development for the purpose of quickly establishing landing grounds for civil aircraft while a more permanent aerodrome was being constructed.

Many wartime aerodromes were only temporary and at the end of hostilities were either handed back to the owners of the land or were adapted, where suitable, for civil aviation. On the other hand, many of the aerodromes created for war purposes were even then looked upon as permanent, with the result that in all parts of the world. particularly in undeveloped countries, good aerodromes were provided which could be put to peaceful uses once the war was over. Ground work done by the air forces in Africa, India, Australia, the far east and the East Indies proved very valuable to civil aviation. A large number of these aerodromes were mere landing grounds and could only be very temporary because of the rapidity of the growth of vegetation in some districts, but the ground had been explored and the information gained of meteorological and other conditions in these places added to the store of knowledge on which to build for the future. Flying boat bases increased in number during the war years, and many of these became permanent. They did not present the same acute problem as the land bases in so far as the alighting areas were concerned; any sheltered area of water of sufficient size was a ready-made aero drome and the flying boat was in consequence much less restricted in its operations. Here again, the knowledge and experience gained established another line of development for postwar civil aviation.

None of the major airports for postwar Europe was completed in 1946. The biggest aerodromes in Europe were to be Heathrow (London airport) in England, Prestwick in Scotland, the Shannon airport in Ireland, Orly in France and an airport under construction at Lisbon. Close to the capital of every important country in Europe, Africa and Australia there was an aerodrome which before World War II was classed as A type, but which in postwar years might be classed as B or C. (See also Aviation, Civil; Aviation, Military; Municipal Government.)

(H. R. G.)

Air Races

In 1937, an Italian crew won the Istres-Paris race 3,800 mi. in 17 hr. 33 min. Frank W. Fuller won the U.S. Bendix transcontinental race (265 m.p.h.), and Rudy A. Kling the Thompson trophy race, chief event of the National Air races, at Cleveland (256.9 m.p.h.). After 1939, air races were discontinued in Europe for the duration of World War II and were resumed only on a very limited scale in 1946. Likewise, the National Air races (U.S.) were cancelled during the years 1940–45.

Jacqueline Cochran won the Bendix race in 1938, and the Thompson trophy went to Col. Roscoe Turner (283.42 m.p.h.), who repeated the feat in 1939. John Livingston won the Glenn H. Curtiss trophy at the 1939 Miami, Fla. meet (156.8 m.p.h.). The Bernarr Macfadden trophy race between New York city and Miami went to Max Constant in 1939 (5 hr. 44 min.) and to H. C. Rankin in 1940 (4 hr. 38 min.). The National Air races were resumed in 1946, with Paul Mantz winning the Bendix transcontinental race (435.6 m.p.h.) and Alvin Johnston taking the Thompson trophy (373.9 m.p.h.). (X.)

Air Raid Defense

Air raid defense or the protection of the civilian population caused both Allied and axis governments grave concern, so much so that in 1938 German, Swedish and British civil defense personnel were-working together in and around the dockyard towns on the Medway in England and witnessing exercises carried out with a view to saving life and dealing with casualties. The Germans provided much better shelter than the British, but Britain was facile princeps in its fire-fighting organization.

Before World War II, Sir John Anderson (later home secretary and minister of home security in Great Britain, 1939-40) lectured to the Imperial Defense college and to the staff colleges on air raid precautions. People with foresight began to think of the future safety of Great Britain and the commonwealth, and passive defense, air raid precautions or civil defense, the new baby of national defense services, was born. It was not at first a popular step and roused little public interest; during the first year of World War II, before the heavy bombing attacks on Great Britain began, quite a large percentage of citizens almost suggested scrapping the carefully-built civil defense organization. The cabinet and the home office meanwhile had deputed to a dozen regional commissioners the duty of co-ordinating civil defense, and these chosen deputies used that time as one of valuable training for fire fighters, rescue and decontamination squads, stretcher bearers, ambulance drivers and attendants, air raid wardens, repair parties, control and reporting personnel, etc. Preparation was made for dealing with the damage to water mains, gas, sewerage and electric light installations.

The shelter problem necessitated the appointment of a special regional commissioner in London. Generally speaking, adequate shelter was provided by local authorities, but some of the boroughs failed to provide proper shelter and ince the deep-shelter policy was turned down by the government as too costly to provide or, for a variety of reasons, an impossible undertaking, basements, surface shelters, underground tube station shelters, etc., were put under central control. Bunks were constructed and made available for distribution, priority of supply being given to the crowded East End boroughs. In recasting the shelter problem, the community was impressed with the need for dispersal as opposed to crowding thousands together in large communal shelters. Some of the bigger shelters were hit, and the casualties were heavy.

Civil defense in Britain was a community business on a territorial basis. Local government was mainly responsible for recruiting its members, acquiring its vehicles, establishing its depots and control centres and, largely, for its training and administration. Usually the town clerk, the chief local government official, was appointed official civil defense controller. In some cities and towns this duty was taken over by the chief constable.

Air raid defense from the civil viewpoint was concerned firstly with saving life, limb and suffering. Property generally came second, but industries, utility services and food supplies had high protection priorities, and it was the duty of the regional commissioners to ensure the minimum interference with production, war effort, health, morale and the education and upbringing of youth. Civil defense, when faced squarely, became a matter of common sense. Expert opinion helped in matters of shelter construction, protection against blast and splinter effect, fire fighting and the strengthening of buildings and special protection of such key points as power stations, pumping stations and communication centres. Water supplies for fire fighting during large-scale attacks were not at first up to requirements. The defect was overcome later by the building of an elaborate system of static water tanks and reservoirs.

British National Fire Service.—The National Fire service, built to start with on the peacetime fire brigade system, was enlarged by what was first called the Auxiliary Fire service, comprising thousands of men and women. The National Fire service built up a vast network of con-

Anderson air raid shelter installed in the bedroom of a private home in Glasgow, Scotland, during World War II



trols which extended and co-operated throughout Britain, and developed a new, highly-disciplined fire organization that was visited by the fire services of the United States, Canada and other Allied countries, whose representatives worked with the National Fire service for weeks at a time before going back to their own lands armed with experience of wartime fire fighting.

There were 1,725 fires in the city of London on Dec. 8-9, 1940, and 780 serious fires on Dec. 29, 1940, when the Guildhall was damaged and eight Wren churches were destroyed.

On March 19, 1941, there were 1,880 fires within the London region. The heaviest "fire blitz" occurred on the night of April 16, 1941, when there were no fewer than 2,251 fires, mainly in Chelsea, Westminster and Lambeth. On May 10, there were 2,154 fires in the centre and West End of London. The fire blitz then began in Liverpool. Following the London fire blitz of Dec. 1940, the government ordered compulsory fire fighting by civilians. Ellen Wilkinson (parliamentary secretary for the ministry of home security 1940–45) took over the general direction of the fire guard, and between the National Fire service and the wardens' service millions of men and women were trained and exercised until fire watching and fire fighting became part of air raid defense.

Civil Defense Services in Britain.—More than 1,000,000 people were enrolled in civil defense in Great Britain. In London alone, excluding the fire guard, nearly 250,000 people were enrolled to man the different services. The air raid wardens were the "front line soldiers" of the blitz; à very great proportion of them were volunteers or "part-timers." Wardens' work included a greater variety of duties than fell to the lot of any other civil defense service. The control room staff-operators, messengers, teleprinter girls, tally board and plotting clerks and the representatives of the heads of services-were in the charge of a selected deputy who supervised the reports from the wardens; the staff dissected them and dispatched the requisite aid. Members of the rescue party services were mainly builders' workmen, trained to lift steel girders and shift masonry and concrete blocks. They tunnelled under the debris of demolished buildings and cleared a way for the stretcher bearers. The rescue parties had their trucks fitted with standard equipment: jacks, levers, pulleys and tackle, wire and hemp rope, acetylene cutting plant, shores, sheer-legs, picks, shovels, axes and tools enough to satisfy most lifesaving and demolition requirements. The ambulance service was mostly run by women in civil defense. In London alone this ambulance service conveyed 93,524 casualties to hospitals and 609,783 inter-hospital patients. Other uses were made of this form of transport, and nearly 1,000,000 repair workers were carried for first aid to bombed buildings.

Closely associated with the ambulance service were the mobile hospital units of the field hospital type, usually with a crew of eight: medical officer, qualified hospital nurse, five assistants and man driver. Included in the casualty services were first-aid posts situated in places selected according to density of population and distance from hospitals. Hospitals, their size and capabilities were all worked into the civil defense plan, as were rest centres and mobile supporting columns, consisting of rescue parties and casualty units equipped to be rushed to any area which, through concentrated bombing, found its resources inadequate. An organization for housing the homeless was included in air raid defense and whether the bombed-out

people were to be accommodated for a very short time or permanently proved a very heavy commitment, especially in London, where well over 1,000,000 homes were hit and more than 250,000 destroyed. (E. R. G. R. E.)

United States.—The interest of the U.S. public in air raid defense followed the course of the war. At the time of Pearl Harbor, civilian defense had 3,516,600 volunteers and 7,031 defense committees. Two years later there were more than 12,000,000 registered, of whom 5,534,000 were assigned to duty in the protective services. By then the United States had the largest force of civilian volunteers ever formed for war service. Air raid defense included the army, the air force, Civil Air Patrol, state guards, state police, Red Cross and community welfare services. Each had a role and was prepared to carry out its part.

Long before Pearl Harbor, much had been done. In Sept. 1939, the governor of New Jersey appointed an emergency defense committee. In May 1940, Tennessee and Virginia organized the first state defense councils. By May 1, 1941, defense councils had been established in most of the states and in more than 1,000 communities. On May 20, 1941, the president, by executive order, established the Office of Civilian Defense.

When war was declared the framework was well under way. The pattern was that set up in England as a result of experiences there in 1940 and 1941. These demonstrated that the armed forces and the peacetime services of fire, police and medicine were not capable of meeting the impact of the new strategy of total war; that the existing services should be expanded with added equipment and personnel; new services should be added and the individual schooled to take care of himself and his home; and the nation should be mobilized to protect itself.

The OCD (headed by a director appointed by the president) with nine regional offices, was the national organization. Each state had its state defense council and many local councils, of which there were, at the peak, more than 12,000. Every community likely to be attacked organized one. The national government had no authority over the state or local councils. The OCD was a planning and co-ordinating body. The state and local defense councils were the operating units.

OCD set up the Civil Air Patrol, Forest Fire Fighters service, Facility Security program and civilian protection schools. Its training manuals and guidance on gas defense, blackout, dimout, shelters, camouflage, organization, communications, safety measures and the many other problems of civilian defense were followed by state and local councils. It became the research and advisory centre.

The army air force operated the Aircraft Warning service, with some 600,000 volunteers to warn communities of impending attack. To insure necessary uniformity, the army promulgated an air raid warning system and controlled practice blackouts. The local units had the true responsibility. Operating through a staff, air raid warden, auxiliary police, auxiliary fire, utility repair, road repair, emergency medical and related services and headed by a commander—the mayor, a well-known citizen, or the head of the police department—these people took their task seriously. They knew that if they failed in their mission there was little hope for their community. Each local unit was expected to be strong enough to handle any anticipated attack.

Every community was far short of the fire equipment necessary to handle effectively the fires resulting from even a small attack. To meet this, in Feb. 1942, congress appropriated \$57,000,000 for pumpers, hose and other equipment for communities in critical zones, and \$43,000,000 for

gas masks, helmets, arm bands, medical supplies and miscellaneous equipment for the individuals of the defense corps.

Neither Germany nor Japan was capable of bombing the United States during World War II. How well the civilian defense organization would have kept down the effect of any air raid attack was unknown. Some units performed creditably in local emergencies, which were, in some sense, tests of their efficiency. Experiences elsewhere pointed to many ways in which it might have been improved, yet it accomplished much. It stood out as the greatest example of U.S. mass mobilization, organization and training ever undertaken by volunteers. Communities found a way to unite by themselves for their own welfare. It gathered the people behind the war effort. (See also Electrical Industries; Incendiary Warfare; Municipal Government.)

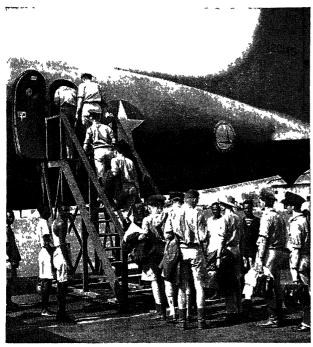
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Air Sanitation

See Public Health Engineering.

Air Transport Command

Before the close of World War II the air transport command of the U.S. army air forces had become the largest agency for air transportation yet developed, and had demonstrated to the world a new principle—strategic air supply. In the beginning, the ATC was a tiny organization with a relatively limited mission. Established on May



U.S. officers boarding a giant Skymaster (C-54) plane at a West African base. The C-54 was in standard use by the air transport command during World War II for long range flights

29, 1941, as the air corps ferrying command, it was made responsible for ferrying aircraft for the British from U.S. factories to transfer points, and for transporting essential passengers and mail between the U.S. and the United Kingdom. Within a year, in answer to the demands of war, its duties were broadened to include delivery of aircraft to Allied forces wherever found and the operation of a world-wide air transportation system. By June 20, 1942, when the ferrying command became the air transport command, it had accomplished or supervised the delivery of 13,513 aircraft to final domestic destinations and 638 to final foreign destinations, and, largely through contract carriers, had transported 1,920 tons of passengers, cargo and mail. Brigadier General Robert Olds, the first commanding general of the command, was succeeded in April 1942, by Lieutenant General (then Colonel) Harold L. George, who continued in this capacity until Oct. 1946.

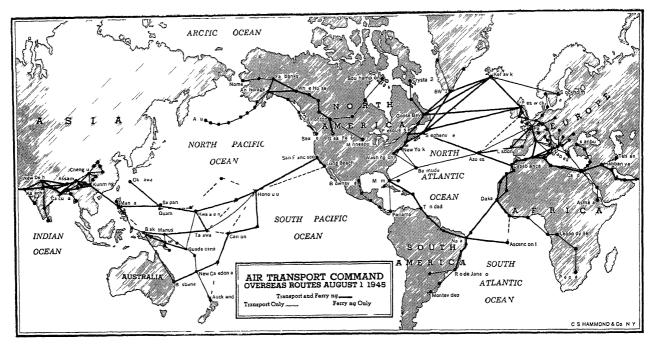
In Dec. 1942, ATC took over the hazardous job of flying the "Hump"—transporting supplies over the Himalayas from Assam, India, to China. Previously the greatest load carried to China in any one month had been 1,136.2 tons. ATC operations gradually enlarged this trickle into a heavy stream—2,278 tons in March 1943, 18,975 in July 1944, and finally the record total of 71,042 in July 1945. Meantime, ATC services elsewhere were expanding. As the Allies advanced on fortress Europe from North Africa and across the channel from Britain, ATC followed. In the Pacific, as the Japanese were forced back toward their home islands, ATC routes moved northward, until the main line no longer ran to Brisbane, Australia, Guadalcanal, or Saipan, but to Tokyo.

In addition to ferrying aircraft and operating regular transport services, the command from the time of its origin conducted a wide variety of special missions: for example, flying President Roosevelt to international conferences, and, within three weeks, transporting 25,799 Chinese troops, their equipment and pack animals into battle areas. After the surrender of Japan, ATC moved 23,456 occupation troops, 1,191 vehicles and a mass of supplies into Honshu, all in 16 days.

The year 1945 was mainly one of redeployment; in two special projects ATC moved 154,497 passengers from the Mediterranean and European theatres to the U.S. and supervised the homeward flight of 5,965 tactical aircraft which, counting crews, returned 84,614 additional men. Air evacuation, begun on a significant scale in 1943, reached the greatest volume in 1945, when the command carried a total of 212,819 patients, nearly two-thirds of them on international routes. In 1946 the command, sharply reduced in aircraft and personnel, shouldered its peacetime responsibilities of maintaining an air link with the occupation forces, providing certain scheduled services and special missions best handled by military rather than commercial carrier, and keeping in readiness a pool of highly experienced personnel and the nucleus of a worldwide air transport organization.

At its peak, the command had a strength of 41,705 officers, 167,496 enlisted personnel and 104,677 civilians. Its scheduled routes extended over more than 146,000 miles. Its aircraft numbered 3,705. By the close of hostilities, it had transported more than 4,000,000 persons over 8,500,000,000 passenger-miles. Its aircraft had flown more than 1,000,000,000 miles to accomplish a traffic movement of 2,702,864,509 ton-miles.

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A.L.A. (American Library Association) See Societies and Associations

Alabama

Alabama, located in the east south central division of the United States, commonly called the 'Cotton state," was admitted to the union Dec 14, 1819, as the 22nd state. Area 51,609 sq mi, including 51,078 sq mi of land and 531 sq mi of water Population (1940) 2,832,961, 1944 estimate, 2,818 083 Of the 1940 population, there were 1,849,097 whites, 983,290 Negroes and 574 of other races, 2,821,004 native born whites and 11,957 foreign born In 1940, 30 2% of the population was urban and 69 8% rural The capital, Montgomery, had a 1940 population of 78,084; chief other cities were Birmingham (267,583) and Mobile (78,720).

In 1937 the prohibition system, in effect after 1915, was abolished and the system of local option by counties was adopted Twenty four of the 67 counties permitted the sale of hard liquors The traffic remained under the control of the state board

Chief officers of the state, 1937–38 were governor Bibb Graves, lieutenant governor, Thomas Knight (deceased), attorney general, A A Carmichael, auditor, C E McCall, secretary of state, Howell Turner, treasurer, John Bran don, superintendent of education, A H Collins, and commissioner of agriculture and industries, R J Goode

Elected for four years beginning Jan 16, 1939, were governor, Frank M Dixon, lieutenant governor, A A Carmichael, auditor, Howell Turner, secretary of state,

John Brandon treasurer, C E McCall, attorney general L J Lawson superintendent of education, A H Collins commissioner of agriculture and industries, J H Paterson An amendment to the constitution, July 1939, provided for election of legislators biennially

In the presidential election of 1940 the voting was Roosevelt 250 723 Willkie 42,184, Babson (Prohibitionist) 700, Browder (Communist) 509, Thomas (Socialist) 100

Chauncey Sparks (Dem) was elected governor Nov 3 1942 to succeed Frank M Dixon Eight of the nine con gressional representatives, all Democrats, were re elected The new representative, from the 9th district, defeated Luther Patrick, the incumbent, in the Democratic pri maries run off election in June Aside from Gov Sparks, the principal state officers elected in Nov 1942 were Handy C Ellis, lieutenant governor, Warren C Lusk treasurer, John Brandon, auditor, Howell Turner, secre tary of state, Joe N Poole, commissioner of agriculture and industries, and Elbert B Norton, superintendent of education (A B Mo, X)

Six amendments to the state constitution were proposed at the 1944 general election, four were ratified Incum bents of principal elective offices of the state government were Chauncey Sparks, governor, Handy C Ellis, lieu tenant governor, William N. McQueen, attorney general John Brandon, auditor, Joe N Poole, commissioner of agriculture and industries, Gordon Persons, chairman, Pub lic Service commission, Sibyl Pool, secretary of state, Wal ter C Lusk, treasurer, and Elbert B Norton, superintend ent of education Votes cast for presidential electors at the election of 1944 were as follows Democratic 198,918 Republican 44 540, Prohibition 1,081, and Socialist 190

The legislature met in regular session from May 1 to June 29, 1945, inclusive, introducing 993 bills, passing 437 acts and proposing 10 amendments to the state constitution 9 of which were not to be voted upon by the people until 1946. The defeated proposed constitutional amend ment voted upon on Oct. 2, 1945, proposing to change the disposition of the state income tax revenues, received



42,368 votes for and 75,308 votes against.

In 1946, the following were elected to the principal state offices, with terms beginning in Jan. 1947: James E. Folsom, governor, J. Clarence Inzer, lieutenant governor; Albert A. Carmichael, attorney general, Dan Thomas, state auditor; Haygood Paterson, commissioner of agriculture and industries; Sibyl Pool, secretary of state; John Brandon, state treasurer; Austin R. Meadows, state superintendent of education.

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	Alabama S	Statistical D	afa		
	Table I.—Ed	ucation (Pu	blic)		
	1936	1938	1941	1944	1945
Elementary school pupils	595,794	583,203	496,973 189,794	451,984 195,570 12,599	451,984 195,570 12,523
High school pupils Elementary teachers	81,268 12,885	87,278 12,846)	189,794	195,570	195,570
High school teachers	5,536	12,846 6,073	19,393	6,839	6,908
	Table II.—F	ublic Welf	are		
19:					1945
	646 2,0	19 2,	498 2,31	37	
Recipients of old-age pensions 15,1	897	19,9	940 20,01	36 29,922	32,590
Dependent children re- ceiving aid 16,5	:14	17,1	34 16,81	5 4,772	5 3 4 2
Blind receiving aid 16,5	174	17,1	500 61	5 728	5,342 767
Workers under unem-					
ployment compensa- tion 325,0	000 258,0	48 269,2	200		
·	· ·	-			
	Table III.—(Communical	tions		
(All mon	ey figures in	thousands	of dollars)		
1937	1938	1939	1940	1944	1945
State highway mileage	6,601	6,471	i	6,965	7,050
Expenditure on	•	,			
highways \$17,13 Railroad mileage . 5,08	1 \$19,880 2 <i>5</i> ,069	\$18,567 5,052	\$27,723	\$8,409 5,216	\$11,108 6,724
Number airports .	2 3,007	3,032	3:	5 41	49
Ta	ble IV.—Ba	nking and l	Finance		
(A	ll money fig	ures in thou	ısands)		
1937	1939	1940	1942	1944	1945
State revenue \$57,070 State expenditures \$49,391	\$65,781	\$66,129	\$102,870	\$86,772 \$84,287	\$95,000
Natl. bank	\$44,469	\$65,047	\$91,439	-	\$82,000
deposits \$191,679 State bank	\$235,344	\$267,586	\$233,731	\$628,046	\$762,252
deposits Number of banks 217			\$96,321	\$260,136 218	\$340,998
Number of banks 217	216	218	216	218	216
		-Agricultu			
1007	(All figures		•	10/0	
1937 Corn, bu 46,792	1939	1940	1942	1943	1945
Cotton, bales 1,631	785	43,450 779	43,960 925	48,510 959	50,626 935 5,275
Oats, bu 2,646	2,838	3,000	4,800	3,936	5,275
Potatoes, bu 3.780	4.860	210,250 4,176	335,400 3,922	416,150 5,264	339,300 5,200 6,375
Potatoes, sweet . 8,800	8,800	4,920		-	6,37
l'obacco, lb 245	3 410	415	215	265	
	Table VI	Manufaci	rina		
(A	Il money fig				
·		935	1937	1939	1944
Manufacturing establishments			1.781	2.052	2.05
Wage earners	• • • • •	4,345	120.301	125.500	255,196
Value of products	\$35	50,643 57,226 \$	\$96,058 573,764	\$109,687 \$574,671	\$463,15
		•	-	•=	
T	able VII.—A	Ameral Pro	duction		
	(All figure	s in thousai	nds)		
1937 Total value of	1938	1939	1941	1942	1943
production . \$53,519	\$46,296	\$54,124			\$102.01
Coal 29,857	26,769	27,708	\$41,985	\$55,408	\$102,01 58,57
iron ore 10,748	7,342	9,971	18,090	19,034	21,04

3.738

Alanbrooke, 1st Viscount (Alan Francis Brooke)

Viscount Alanbrooke (1883—), British peer and army officer, was born July 23, 1883, at Bagnères de Bigorre, France. Following completion of his studies at the Royal Military academy, Woolwich, he joined the field artillery, 1902. At the outbreak of World War I, he went to France with the B.E.F. and was a general staff officer of the royal artillery at the time of the Armistice, 1918. After the war, he joined the staff college, Camberley, and the imperial defense college and was commandant of the school of artillery, 1929—32. In 1939, he was named commander in chief of the anti-aircraft command.

As commander of the B.E.F.'s 2nd army corps in May 1940, he was one of the British military leaders responsible for the effective rear guard defense of the British forces that were evacuated from Dunkirk in May and June. Back in England in early June, he hastily reassembled and reorganized the vestigial British forces for the expected invasion and directed defense preparations. He was knighted for his achievements in Europe and on July 19, 1940, he succeeded Sir Edmund Ironside as commander in chief of British home forces.

On Nov. 18, 1941, he became chief of the British imperial general staff. In this capacity, he accompanied Churchill to the numerous conferences with Roosevelt and Stalin. He was made a field marshal in the king's New Year's honour list for 1944 and was awarded, that same year, the Order of Suvorov, first class, the soviet union's highest military decoration. He was named a baron in Aug. 1945 and on Jan. 1, 1946, he was created 1st Viscount Alanbrooke.

Alaska

Alaska, one of two duly constituted territories of the United States, was discovered by Vitus Bering and Alexei Chirikov in 1741. It was purchased by the U.S. from Russia in 1867 for \$7,200,000. This vast territory of 586,400 sq.mi. was for many years under the control and supervision of the U.S. army. It was given territorial status in 1912 with the passage by congress of the Organic act, which provided for a legislature of two houses and permitted the residents of the territory to elect some of their own officials.

During the decade 1937–46, great changes took place in Alaska. Whereas ten years before only a few aeroplanes were used in the territory, a network of established air lines, airfields and feeder routes had put Alaska on the air map of the world by the end of the decade. One could in 1946 travel from Point Barrow, the northernmost tip of the territory, to Juneau, the capital in the southeast archipelago, in one day—a distance of more than 1,000 mi. Ten years before, one trip a year to Barrow with an icebreaking boat was the only transportation possible to and from that outpost.

With the coming of World War II, Alaska's population leaped to more than twice the 1939 census figure of 72,524. Prior to 1940 and 1941, Alaska's military and naval establishments were virtually nonexistent. It had a garrison of only some 200 regular army infantry at Chilkoot barracks, near Haines. Before the end of the fiscal year June 30, 1941, however, federal expenditures of some \$70,000,000 had been authorized for Alaska's defense. Construction on navy bases at Sitka, Kodiak and Dutch Harbor and on army bases at Anchorage, Fairbanks, Nome and the Aleution chain were undertaken. This vast expenditure brought thousands of construction workers to the territory in addition to the military personnel. Many of these remained in the territory. The estimated population in 1946 was approximately 100,000.

World War II brought permanent improvements to Alaska in the form of fine airports, radio range stations and other aids to aerial navigation. It brought some 400 mi. of additional highway, particularly the 136-mi. Glenn highway from Palmer connecting the network of roads around Anchorage with the Richardson highway; that portion of the Alaska Military highway (the road through Canada to the U.S.) extending from Big Delta, 203 mi. southeastward to the Yukon territory boundary; and the so-called 72-mi. Tok cut-off connecting this highway with the Nabesna road.

From the very beginning of the war years, Alaska industry converted itself to war activity. The fishing industry, long the mainstay of Alaska's economic structure, operated in accordance with the salmon industry's consolidation plan under the direction of the secretary of the interior, which required the concentration of the industry in the more efficient plants in order to effect savings in manpower, equipment and critical materials, and to lessen the requirements of shipping facilities. As high as 75% of the salmon pack during the war years went directly to the armed forces.

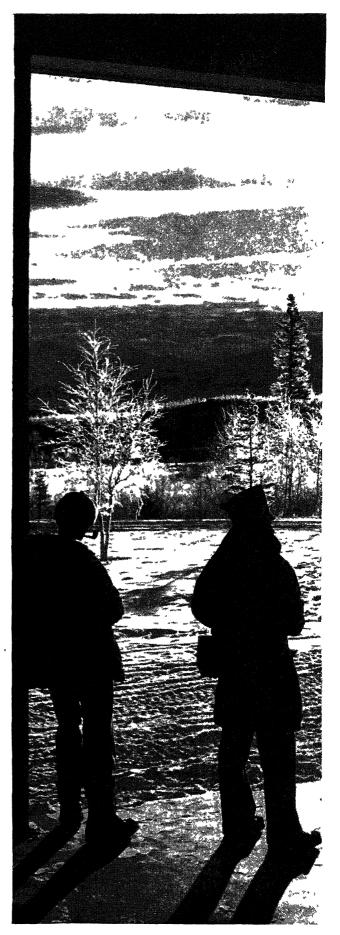
The mining program for the field seasons of the war years also was influenced by the needs of the U.S. war and navy departments. At the close of the fiscal year 1945, six projects relating to mineral commodities, for which there was an acute demand to meet war needs, were in progress. Possibilities for the development of petroleum projects were investigated at Katalla and Wide Bay in the summer of 1944 and along the Killik river, a tributary of the Colville river in northern Alaska.

Military activity in Alaska and the subsequent influx of labour necessary for the completion of military and naval installations resulted in a critical coal shortage during the winter of 1943-44. In co-operation with the Military Coal commission, the bureau of mines undertook to investigate the extensive coal deposits of Alaska and to prove by exploration the existence of the more extensive minable beds. As a result of this work, reserves adequate to supply the demands of the territory for many years were proven.

In the field of war finance activities the achievement of Alaska and its people was noteworthy. In the 1943 and 1944 war fund campaigns, Alaska established the highest record of any state or territory, attaining more than 175% of its quota. In the period from May 1, 1941, to Dec. 31, 1945, Alaska's population had purchased \$23,755,000 worth of "E" bonds. In addition, \$5,150,000 was invested in other forms of government bonds. It was significant also that from its census population of 72,524, Alaska had 5,309 of its men and women in either the armed forces or their auxiliaries, serving in every theatre of war and in most of the major combat engagements. To assist these returning service people, the 1946 special territorial legislature enacted a liberal law which provided that Alaska veterans would receive a cash bonus of \$10 for every month of service, or, two classes of loans: first, loans up to \$2.500 for educational, domestic and other purposes, and second, loans up to \$10,000 to purchase or build homes, acquire farms or other business property, or to finance mining, fishing and other enterprises.

While there were certain cutbacks in fish production during the war, Alaska produced approximately 50,000,000 cases of canned salmon during the decade, with an average

U.S. soldiers on leave at the McKinley park hotel, Alaska, during World War II. The hotel, built by the U.S. government in 1938 for tourists, was taken over by the U.S. army to provide a vacation spot for war department employees in Alaska as well as for soldiers on leave from duty in Alaska or the Aleutian Islands





price of from \$10 to \$12 per case. The halibut fishery yielded between 40,000,000 and 50,000,000 lb. annually during the decade. Shrimp, crab and clam production yielded additional millions to fish production.

Despite a drop in fur production during the war years, the average annual value of skins taken in Alaska was approximately \$2,000,000. This included mink, otter, fox, ermine and marten. Fur seal production in the Pribilofs, handled under international agreement, was suspended during the war, but during the three years preceding hostilities and in 1945–46 the estimated value of seal skins taken was \$1,000,000 a year. Fish and wildlife officials reported that, during the 1946 season, the seal herd which ten years before was almost extinct had been built up to more than 3,000,000 animals. Exceptionally high postwar prices encouraged the fur industry, and steps were taken to revive fur farming, which had been retarded during the war.

An event of outstanding importance in 1938 was the closing of the Copper River & Northwestern railroad, which had been built in 1908 from Cordova to Kennecott to ship ore from the Kennecott copper mine to the coast. It was built under the most difficult engineering conditions at a cost of \$24,000,000, and later became the basis for Rex Beach's novel *The Iron Trail*. Exhaustion of the rich copper ore deposits led to the closing of the railroad. Later Cordova, which had been largely dependent on the railroad and the copper mines, developed one of the outstanding clam fisheries in Alaska.

School enrolment steadily increased and 44 1 ural and 18 city schools had a total enrolment of more than 5,000 white pupils in 1946. Fourteen of the territory's high schools had been accredited, so that students completing the four-year course were eligible to enter various colleges and universities. The entire plant of the University of Alaska at College, near Fairbanks, was taken over by the army during World War II and served as a training centre for various army personnel. In addition to the white schools, the Alaska native service, under the department of the interior, maintained 119 day schools and three vocational high schools for Indian, Eskimo and Aleut children in 1946, with an enrolment of around 8,000. Total enrolment in all schools, both white and native, averaged around 13,000 annually over the decade 1937–46.

Communication service to the territory made great strides during the decade. Sept. 26, 1946, saw the opening of land line telephone service between southeast Alaska, interior and westward Alaska and continental U.S. for the first time. This was accomplished by the Alaska communications system, a branch of the U.S. army signal corps, laying a cable from Juneau, the capital, to Skagway, at the north end of the southeast Panhandle. At the latter point, connection was made with the line built by the army during the war years, running to Whitehorse in Yukon territory and thence along the Alaska Military highway to Edmonton, Canada, and on to the U.S. via private lines. New cables were in process of being laid in 1946 between other southeast Alaska towns-Petersburg, Wrangell and Ketchikan. Anchorage and Fairbanks previously had land line telephone connection to the states. Ten years before, the only communication possible was by signal corps radio and, seven years before, by radiophone. In addition to the army's Alaska communication system, covering all major points in the territory, the Alaska Aeronautics and Communications commission, territorially supported, provided

Mountains of Attu through which U.S. forces filed to attack Japanese after landing on the tiny Aleutian island May 11, 1943 radiophone service to most of the smaller places and extended an added service

to aeroplanes.

Population figures of the Oct. 1, 1939, census: 39,170 white, 15,576 Eskimo, 11,-283 Indian, 5,599 Aleuts, 262 Japanese, 633 other and unknown races; total, 72,524. Population of incorporated towns by 1939 census: Juneau, 5,729; Ketchikan, 4,695; Anchorage, 3,495; Fairbanks, 3,455; Sitka, 1,987; Nome, 1,559; Petersburg, 1,323; Wrangell, 1,162; Seward, 949; Cordova, 938; Kodiak, 864; Skagway, 634; Valdez, 529; Douglas, 522; Craig, 505; Klawock, 455; Seldovia, 410; Haines, 357, Unalaska, 298.

Governors of Alaska during the decade 1937-46 were: John W. Troy (May 27, 1937, to Dec. 6, 1939); Ernest Gruening (after Dec. 6, 1939). Secretaries of Alaska were: Edwin W.

Griffin (June 22, 1937, to Feb. 2, 1939); Edward I.. Bartlett (Feb. 2, 1939, to July 1, 1944); Llewellyn M. Williams (after July 1, 1944). Elected territorial officials were: Ralph J. Rivers, attorney general; Frank A. Boyle, auditor; Oscar G. Olson, treasurer; W. Leonard Smith, highway engineer; Walter P. Sharpe, commissioner of labour. Appointed territorial officials: Ben D. Steward, commissioner of mines; Dr. James Ryan, commissioner of education; George Gasser, commissioner of agriculture; Dr. C. Earl Albrecht, commissioner of health; Russell G. Maynard, director of public welfare; Robert E. Sheldon, director Unemployment Compensation commission. (See also WORLD WAR II.) (L. M. W.)

*1939.

Education
Total enrolment for all schools

†To U.S only

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Alaska Highway

See Roads and Highways; Yukon Territory.

Albania

Albania is a nation in the western part of the Balkan peninsula bordering on the Adriatic. Area 10,631 sq.mi.; pop. (census 1930) 1,003,068; (estimate 1939) 1,063,000. Capital, Tirana. Chief cities (1930 census): Tirana (30,-806); Shkodër or Scutari (29,209); Korce or Kortcha (22,787); Elbasan (13,796); Vlonë or Valona (9,100). Religion: Mohammedans (688,280); Orthodox Christians (210,313); Roman Catholics (104,184).

The ten eventful years of 1937-46 witnessed the temporary eclipse of Albania as an independent nation and her restoration as one of the Balkan states under soviet Russia's influence. The country, which had proclaimed its independence from Turkey on Nov. 28, 1912, was ruled as a constitutional monarchy in 1937 by Ahmed Bey Zogu, who had been elected president of the Albanian republic

Alaska: Statistical Data 1944 1941 1938 Value (000 (000's (000' Amount or mount or ltem Number omitted) Number omitted) omitted) Number Finance Gov. revenues \$2,544 \$2,283 \$3,142 \$2,736 490 mi. 3,050 mi. Navigable waterways (rivers) 3,180 mi 664,973 oz 14,549 tons 89,174 " 695,467 oz. 72 tons Gold Platinum (crude) 25,400 oz. 39,889 oz. Livestock 312,854* 19,461* 17,483* 147,609 tons 117,433 ,, 8,009 ,, 2,937 ,, Sea products—total Salmon (canned) Salmon (other) 215,563 tons 163,368 tons 11,560 ,, 37,527 ,, 166,369 " 8,215 " 6,778 ,, ... Wood and paper* \$78,264 \$42,920 \$21,614 \$3,792 Exports—total . . 186,000 tons 817,000 oz \$59,205‡ \$2,000‡ 187,000 tons \$57,094 \$17,930 86,000 oz.‡ Gold and silver† \$3,792 \$2,641 724,000 \$7,144; 410,000; \$4,275 \$42,852 \$5,246 \$2,493 \$4,6971 \$1501 25,000 tons ‡ 28,000 tons \$6.409 34,000 tons

5,000 tons

\$2.018

11943.

on Feb. 1, 1925, and became King Zog I on Sept. 1, 1928, after the republic was changed into a monarchy. In the latter year, Albania received a democratic parliamentary constitution, with only one elected chamber. In her foreign policy Albania was bound to Italy by a defensive alliance concluded on Nov. 22, 1927, for 20 years.

8,000 tons

\$4.011

§From US only

\$4,436

7,000 tons ‡

13,289

Italian Occupation.—On April 7, 1939 (Good Friday), Italian forces suddenly invaded Albania. King Zog was forced to flee, and the country received a new constitution, according to which it became a nominally independent kingdom under the crown of Italy. King Victor Emmanuel III, emperor of Ethiopia, became king of Albania; the principles of fascist life and administration were introduced officially as the foundation of Albanian civilization.

The following year in Albania was taken up with the construction of strategically important roads to the Greek and Yugoslav frontiers, fortification of the country and the storing of large military supplies. In Aug. 1940, the press in Albania and in Italy began a violent campaign against Greece, accusing the latter of oppressing the Albanian minority in the Greek Epirus and claiming the need to protect and liberate these Albanians. In pursuance of this policy, Italy on Oct. 28 suddenly presented an ultimatum to Greece and three hours later started to invade the country from Albania. Against all Italian expectations, the heroic Greek resistance forced the Italian armies not only to withdraw entirely from Greece, but to retreat into the interior of Albania. At the end of November the Greeks occupied the most important Italian military bases there, Kortcha in the north, the third largest town in Albania, situated in a well cultivated and prosperous area, and Argyrokastro in the south, the fifth largest town. From there the Greeks pressed forward toward the sea, conquered Porto Edda, named after Mussolini's oldest daughter, and pushed toward the great port of Valona and toward Elbasan in the centre of the country. The British

royal air force repeatedly bombarded Valona and the other large Albanian port, Durrës or Durazzo.

At the beginning of 1941 the Italian troops under strong Greek pressure were everywhere in retreat, and the Greek armies were in occupation of a large part of Albanian territory in the east and southeast of the country, where they restored the Albanian law as it had existed before the invasion of the country and its union with Italy. In the first months of 1941 the Greeks succeeded in holding all Italian attempts at a reconquest of the lost territory, and even expanded their hold on the country.

In March 1941, Premier Mussolini himself visited the Albanian front and assumed personal direction of the operations. Nevertheless, the Italian offensives all failed with very heavy losses. Neither, however, were the Greek forces strong enough to capture the long-assaulted Tepeleni on the central front and Valona on the sea. But the Albanian situation changed fundamentally through Germany's active participation in the war against Greece. On April 6, 1941, the German forces began active operations against Yugoslavia and Greece. By mid-April the Yugoslav army had surrendered, the Greeks were pushed far back and were unable to hold the Albanian front any longer. Under these conditions the Italians could reoccupy the parts of Albania evacuated by the Greeks, and on April 22 even cross the Greek frontier. The next day the Greek army in the Epirus surrendered to the advancing Germans. From that moment Albania came again under Italian administration, and fascist laws were reintroduced throughout the country.

Confusion After the Italian Surrender.—The Italian capitulation in 1943 threw Albania into a turmoil. The Allies had pledged repeatedly the restoration of a free Albania, and Prime Minister Winston Churchill reiterated this pledge in the house of commons on Nov. 4, 1943, promising an Albania "free from her Axis yoke and restored to her independence." He also said that British officers were co-operating with Albanian guerrillas.

There existed no Albanian government in exile, and Albania was not recognized officially as one of the United Nations. King Zog lived in exile in England, whence he later moved to Egypt.

The Germans promised the creation of a Great Albania at the expense of Yugoslavia and Greece, and insinuated that a victory of the United Nations might mean the division of Albania between Yugoslavia and Greece. But the Albanian Freedom movement continued throughout 1944 to fight the Germans. As in Yugoslavia and Greece there were different rival factions. The party of National Liberation with its "People's Liberation Army," under communist influence and the leadership of Enver Hoxha, a 36-year-old former schoolteacher, resembled the group led by Tito in Yugoslavia and the E.A.M. in Greece. The more conservative National Front (Balli Kombtar) was opposed to the first group, while the supporters of the exiled Zog formed a third faction under the leadership of Abbas Kupi.

The United Nations repeatedly appealed to the Albanians to unite against the Germans. On the fifth anniversary of the Italian invasion of Albania the United States state department reaffirmed the refusal to recognize the annexation of Albania and asked the Albanians to hasten the restoration of their country by uniting. In May 1944 deputy prime minister Clement R. Attlee disclosed in the house of commons that Great Britain had liaison officers in Albania trying to establish a united

front against the Germans and was sending arms and ammunition to the various guerrilla bands. During the summer of that year, battles developed in Albania between the Germans and Albanian patriots, while Allied intervention succeeded in preventing conflicts among the rival factions of the patriotic forces. In the fall, with the changing war situation in the Balkans, the German position in Albania weakened.

Liberation.—In Oct. 1944, British forces captured the port of Sarande in southwestern Albania, opposite the Greek island of Corfu, and on Nov. 18 Tirana, the capital of Albania, was liberated by Albanian patriots. A provisional government of the "People's Liberation Army" promised far-reaching social reforms, declared itself for full collaboration with Tito's Yugoslav regime, and insisted on the territorial integrity of Albania. Hoxha was proclaimed head of the government in addition to his posts as minister of war and commander in chief of the Albanian army. The Albanian leader, looking to Moscow for guidance, glorified Marshal Stalin's Russia and Marshal Tito's Yugoslavia as examples of true democracy.

The Albanian government's demand for a seat at the United Nations conference in San Francisco, Calif., transmitted to the world by the Russian and Yugoslav radios, was rejected. On May 8, 1945, an informal U.S. mission under John F. Jacobs entered Albania to survey conditions. On Aug. 1 an agreement was signed between the Albanian government and Col. D. R. Oakley Hill, chief of the United Nations Relief and Rehabilitation administration in Albania, according to which U.N.R.R.A. would furnish Albania with food, textiles, engineering equipment and medical and agricultural supplies to be distributed "without discrimination" by Albanian authorities. On Nov. 10, 1945, the U.S., Great Britain and Russia recognized the Albanian regime. Elections at the end of November confirmed the Hoxha regime.

The National Assembly, in which only the one governing party, renamed Democratic Front, was represented and no opposition was allowed, proclaimed Albania a republic in Jan. 1946. Throughout the state Russian influence became paramount. Col. Gen. Hoxha's chief adviser was the minister of information, M. Maleshova, ideological leader of the Albanian Communist party who had lived for 15 years in Russia and returned only during the war to his native land. Much was done for the upbuilding of the country during 1946; U.N.R.R.A. relief supplies enormously improved the economic situation and the state of public health. But civil liberties, though proclaimed on paper, ceased to exist. The Catholic element in the northern part of Albania and the Greeks in the south complained especially about systematic persecution. By maintaining a relatively large army and by controling the strategic island fortress of Sasseno, Albania came to occupy an important political position dominating the Adriatic sea.

In the latter part of 1946 diplomatic differences between Albania on the one side and the United States and Great Britain on the other side grew more serious. Bitter Albanian propaganda was directed against the two countries. As a result of the unfriendly attitude of the Albanian government Britain recalled its military mission. A Russian demand for the admission of Albania to the Paris conference on the Italian treaty in Aug. 1946 was opposed by the U.S. secretary of state, James F. Byrnes. Albania concluded a naval agreement with Yugoslavia on Sept. 10, 1946, and was reported to have heavily fortified, with Russian help, strategic points on the Adriatic coast. In Nov. 1946 the U.S. diplomatic mission at Tirana was withdrawn.

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(H. Ko.)

-	Alba	nia:	5	tati	istical Data, 1938	
ltem					Value (000's omitted)	Amount or Number
Exchange rate United States Great Britain	::		:	:		1 franc = 30 cent 20.6 gold francs
Finance Government revenues Government expenditures Gold reserves National debt	s		:	:	\$7,867 (£1,609) \$7,867 (£1,609) \$2,273 (£465) \$20,460 (£4,185)	
Transportation Highways						1,383 mi.
Minerals Aluminum	: :		:	:		9,920,700 lb. 139,992 tons 4,409 "
Crops Corn				:		155,755 " 49,493 " 17,306 " 12,456 "
Livestock Poultry				:		2,000,000 1,573,857 932,333 391,175
Forest Products Tar			:	:	\$153* (£31) \$39* (£8) \$38* (£8)	•••
Exports Total	: :				\$2,925 (£598) \$397 (£81) \$395 (£81) \$248 (£51) \$243 (£50)	
Imports Total	 	:			\$6,719 (£1,374) \$1,450 (£297) \$489 (£100) \$310 (£63) \$261 (£53)	
Defense Standing army personnel Standing navy personnel Military expenditures	::	:		:	\$2,875 (£588)	13,040 141
Education State elementary schools Enrolment State secondary schools Enrolment *Exports only, †1939.	::	٠	•	: :	•	663† 56,936† 19† 6,235†

Alberta

Alberta, created on Sept. 1, 1905, is the most westerly of Canada's three prairie provinces, although consisting more of foothills and forests than prairies. Its area is 255,-285 sq.mi., 6,485 sq.mi. of which are water. Saskatchewan lies for 750 mi. along the east; the Northwest Territories extend 400 mi. across the north; British Columbia is along the west, where the boundary line is the eastern fringe of the Rocky mountains; 100 mi. of Montana is along the

Centres of population are Edmonton, the capital (1901 census, 4,176; 1941, 93,817; 1943, 131,050); Calgary, Lethbridge, Medicine Hat (1941 census: 88,904, 14,612, 10,571 respectively). There are many language groups in Alberta, but English predominates: German, Ukrainian and Scandinavian groups are next. Largest religious group in 1941 was the United Church of Canada, with the Roman Catholic Church a close second and the Church of England third. Twelve other religions were listed.

The population of the province increased from 731,605 in 1931 to 796,169 in 1941. Despite the shifts caused by World War II, the dominion bureau of statistics estimated growth to 826,000 by 1946; but population density in Alberta was still second lowest in Canada, with 3.2 persons per square mile as compared with the Prince Edward Island figure of 43.52 persons.

Lieutenant governors during the 1937-46 decade were

Lieutenant Col. P. C. H. Primrose (Sept. 10, 1936-March 20, 1937), John C. Bowen (from March 20, 1937). Premiers during the period were: William Aberhart (Sept. 3, 1935-May 23, 1943), E. C. Manning (from May 31, 1943).

THE CENTRE of interest during the 1937-46 decade was, for reason, the Social Credit provincial government, only one of its kind holding office anywhere. In 1935 it had swamped the United Farmers of Alberta by winning 56 of the 63 seats in the legislature; it retained office in the 1940 election, though dropping to 36 seats; but in 1944 it won 51 seats. Electoral confidence was maintained, despite repeated failures to produce the much promised social credit dividend, because both the Aberhart and the Manning (but most particularly the latter) governments were characterized by administration efficiency. Nevertheless,

both leaders made efforts to practise social credit doctrine. After working on the "\$25 a month for everybody" proposition from Aug. 1935 to May 1936, and producing no results, Aberhart began to plead for more time. He said: "Development of Social Credit from theory to actual working operation must be a process of deliberate planning in stages." Accordingly, in July 1936 he tried "prosperity bonds," or script to which stamps were to be attached, redeemable in two years. The venture fizzled out. Then came "registration" for the basic dividend; but the \$25 remained mythical. By Dec. 1939 the 1937 acts "to provide for the regulation of credit in the province of Alberta," and to tax the banks to raise funds for the basic dividend, had been declared ultra vires by the supreme court of Canada. The 1938 act concerning the taxation of securities, among others, suffered the same fate. And the judgments of the supreme court had been upheld by the privy council in London. By March 1942, nine of Aberhart's laws, mostly aimed at achieving social credit, had been disallowed.

An effort to establish a provincial bank in order to have closer control over currency also came to nothing. Greatest stir was made when the Aberhart government defaulted in 1941 on half of the interest payments on the provincial debt, but by doing so annual surpluses were achieved

When World War II broke out, the social crediters were already active in a program of post-depression reconstruction. Through the treasury branch and the Alberta Marketing board, a consumer bonus system was set up which (1) increased the purchasing power of consumers and (2) intensified home-market demand for Alberta products. Wartime requirements modified the need for this system, though it was continued throughout the period on a reduced scale. As the war progressed the government organized the Alberta Post-War Reconstruction committee, which presented its final report to the 1945 session of the assembly, and out of which came a new department of economic affairs, charged "to further and encourage orderly economic, cultural and social development for the betterment of the people of the province."

Included were plans for such postwar projects as an eight-year road-building program calling for expenditure of \$8,000,000 per year, a ten-year construction program to provide adequate provincial buildings totalling \$17,500,-000, nine large forestry projects, and a huge improvement scheme for 100,000 farm homes. The Alberta Power commission, founded in 1944, was instructed to expand rural electrification.

In 1946 the legislature passed the Alberta Bill of Rights, for the "establishing of every man in his own right and making him secure in that position by assuring him as a right of citizenship an opportunity to obtain a fair share of the abundant production which our vast resources make possible." It guaranteed minimum annual income of \$600 to every resident over 19 years, and free medical and educational benefits to all under

During the decade of lively political activity by the social crediters, the province did not suffer economically. Capital outlay in agriculture was enlarged, and income from sale of farm products increased. The ratio of mixed farming to grain farming improved, and in 1943 Alberta was the largest hogproducing province of Canada. Under the impetus of World War II, there was also noted industrial expansion: within the decade the number of industries increased by a third,

the number of employees by nearly two-thirds, and the value of finished products almost quadrupled. It was a record beaten only by Ontario.

With 80% of Canada's oil reserves in Alberta, and with wartime needs very large, it was perhaps natural that petroleum production expanded notably during the decade.

Many new wells were drilled. No serious effort was made, however, to tap the fabulously rich oil sands in the northern part of the province.

The most striking transportation expansion was in airways. In 1926, Edmonton had been granted the first airport licence issued to any city by the Canadian government, and this port was extremely active from 1926–46 in opening up the Northwest Territories by air. It was vital as the pivot of the Northwest Staging route during World War II.

During the decade Alberta became a model of fine arts instruction, with the founding and successful operation of the only Canadian annual summer School of Fine Arts at Banff, which attracted students from all parts of Canada and from many United States centres. (C. Cy.)

Alcan (Alaska) Highway

See Roads and Highways; Yukon Territory.

Alcohol, Industrial

Before 1937, the U.S. requirements for industrial alcohol fluctuated from about 40,000,000 gal. to 100,000,000 gal. annually. The production was chiefly from grains and molasses, and synthetic plants had limited capacity. By

,		Value	1938	Value	1941 Amount or	Value (000's	1944 Amount or
ltem		(000's omitted)	Amount or Number	(000's omitted)	Number	omitted)	Number
Exchange rate Great Britain			4.867 Canad \$=£1	ian	4.45 Canadian $=$ £1		4.45 Canadian \$ =£1
United States			1 Canadian =99.4 cent		1 Canadian \$ =90.9 cents		1 Canadian \$ = 90.9 cents
Finance Provincial revenues		£4.907		£6,336		£6,175*	
Provincial expenditures .		(\$23,988) £4,344		(\$25,547) £4,699		(\$24,915) £5,093*	
•		(\$21,236)		(\$18,948)		(\$20,549)	
Transportation Railroads Highways			5,750 mi. 90,132 "†	•	5,746 mi. 92,880 "‡		5,682 mi. 81,094 "§
Communication			68,458		77,574		8 <i>7.</i> 975
Telegraph lines			75,843		108,649		7,351 mi. 130,209§
Radio sets			7 3,043		•		
Coal			5,251,233 ton 6,751,312 bb 21,822,108,0 cu. ft.	l.	6,969,962 tons 9,918,577 bbl. 27,459,808,000 cu. ft.		7,428,708 tons 8,727,366 bbl. 37,161,570,000 cu. ft.
Cement			304,373 bb 792,760 tor		414,183 bbl. 1,722,465 tons		699,989 bbl. 833,524 tons
Crops Wheat			4,446,000 tor	ıs	2,655,000 tons	-	2,400,000 tons§
Oats			1,616,000 " 1,575,000 "	-	1,136,000 '' 1,300,000 ''		1,216,000 ''§" 810,000 ''§
Barley			740,000 '' 545,000 "		648,000 " 588,000 "		888,000 ' \$ 830,000 ''§
Livestock			•		·		
Cattle			1,362,000 834,000		1,342,000 675,000		1,860,000§ 975,000§
Swine			707,000 649,000		1,706,000 649,000		1,469,000\$ 564,000\$
Manufactures			0.17,000		•,	0.45 550	,,
Total		£17,440† (\$86,225)	• • •	£18,954¶ (\$84,059)	•••	£47,5709 (\$191,944)	•
Slaughtering & maut pack	ng	£4,496 (\$22,230)	•••	£4,903¶ (\$21,744)	• • •	£17,9439 (\$72,398)	•••
Flour and feed mails		£2,768† (\$13,684)	•••	£2,150¶ (\$9,537)	•••	£4,3619 (\$17,598)	•••
Butter and cheese		£1,744† (\$8,620)	• • •	£1,887¶ (\$8,371)	•••	£3,9789 (\$16,053)	•••
Petroleum products		£1,694† (\$8,374)	•••	£2,228¶ (\$9,881)	•••	£4,170° (\$16,826)	•••
Education enrolment Provincial schools			170 4505		170.691		159,810
Private schools			170,452¶ 4,964¶		5,958		6,547
Dominion Indian schools . Universities and colleges.			2,01 <i>7</i> ¶ 2,875¶		2,029 2,591		1,945 2,618
*Preliminary figures.	†1937.	‡1	942.	§1945.	[[1940.	¶1939.	ହ1943.

1941 the need for more alcohol increased and new plans were made to expand the industry. Alcohol for beverages was restricted to increase the supply for war uses, including the manufacture of powder and synthetic rubber. Requirements were estimated in 1942 at more than 350,000,000 gal., three times prewar production. By 1943 production had passed this goal and rose to more than 500,000,000 gal. in 1944. Production was increased by building grain alcohol plants in the grain belt, by expanding plants using molasses from sugar cane in Cuba, and by building new plants to make alcohol from the waste products of wood pulp used in paper manufacture. The latter method had been developed in Sweden and proved successful.

The use of grains, particularly wheat, was increased from about 2,000,000 bu. in 1942 to more than 144,000,000 bu. in 1944. Since stocks of wheat were very large, the use of wheat was limited only by the alcohol-making facilities. By taking over the liquor-making plants the use of grains was increased. The amount of grain used declined somewhat early in the year 1945 because of the poor outlook for the new crop. In July the U.S. secretary of agriculture announced that no corn could be used for either industrial or beverage alcohol. In 1945 the rubber industry turned to using petroleum products and the requirements for grain alcohol became less urgent. The need for munitions declined while the need for grains for food and feed increased. Only 85,000,000 bu. of wheat were used for alcohol making in 1945 and practically none in 1946.

All of the blackstrap molasses from the 1944-45 Cuban sugar cane crop was purchased by the U.S. Defense Supplies corporation. Sugar was so scarce that allotments to

industrial users were limited to 70% to 80% of the amount consumed in the same months of 1941. In July 1945, this allotment was reduced to 50% as the food requirements became more urgent. The Defense Supplies corporation bought alcohol produced in Cuba and Puerto Rico from the 1943 and 1944 sugar cane crops. Wheat became so short in supply in 1946 that the use of wheat in distilling was prohibited.

U.S. Production of Industrial Alcohol, 1937-46 (In gallons)

1937 115,291,000 1942 266,572,000 1938 103,525,000 1943 385,447,000 1939 103,750,000 1944 519,977,000 1940 126,097,000 1945 176,240,000 1941 155,933,000 1946 21,216,000

The improved methods of making alcohol from various by-products, wood pulp, potatoes, low-grade grains, etc., were greatly improved and promised to provide a low-cost alcohol for use in the making of synthetic rubber and other new products. Grain alcohol was expected to continue to be expensive so long as the need for grain for food and stock feeds continued high. With the restoration of sugar production in the world the supply of molasses would be sufficient to provide a normal output from that source.

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(J. C. Ms.)

Alcoholic Intoxication

See Intoxication, Alcoholic.

Alcoholic Liquor

See Brewing and Beer; Liquors, Alcoholic; Wines.

Aleutian Islands

See WORLD WAR II.

Alemán, Miguel

Alemán (1903–), Mexican statesman, was born in the small village of Acayucan, Veracruz state. His father, originally a village shopkeeper, became a revolutionary general who participated in the revolt that led to Porfirio Díaz's overthrow in 1911. The son graduated with honours in 1928 from the law school of the National university of Mexico and was admitted to the bar in Mexico City the same year. He acted as attorney for labour unions, held a number of minor political posts and was justice in a federal appeals court until his election to the senate. In 1936, when the governor-elect of Veracruz state was assassinated, Alemán resigned from the senate to assume the governorship. During his tenure, he carried on a vigorous campaign against illiteracy, devoting 47% of his budget to education.

In 1940, Alemán left the governorship to become presidential campaign manager for Gen. Manuel Avila Camacho. After his election, Avila Camacho appointed Alemán to the post of minister of interior and minister of government. Shortly after the Japanese attack on Pearl Harbor in Dec. 1941, Alemán took drastic measures to suppress axis espionage activities in Mexico. In June 1945, Alemán began his campaign for the presidency. His chief opponent was Ezequiel Padilla, a cabinet colleague who was foreign minister in the Avila Camacho government. Official returns of the elections, held July 7, 1946, gave Alemán 1,800,829 votes to 431,847 for Padilla. Inaugurated as president Dec. 1, 1946, Alemán announced his program would include greater extension of credit for both agriculture and industry and greater development of transportation. While promising Mexican workers protection of the state, he warned that his government would "maintain the interests of the country above those of individuals or groups."

Alexander, Albert Victor

), British statesman and politi-Alexander (1885cian, was born May 1, 1885 in Weston-super-Mare, England. He left school at the age of 13 to take a position as a junior clerk in the Bristol Education committee, meanwhile attending evening classes at a technical school. At the age of 18, he left his post to work for the Somerset County Education committee, staying with that organization for 17 years. During World War I, he joined the army as a private, rising to the rank of captain. After the war, Alexander, who had been long interested in the co-operative movement, was made parliamentary secretary of the Co-operative congress in 1920. In 1922, he was elected to parliament as a Co-operative party candidate serving until 1931. He was first lord of the admiralty in the MacDonald government, 1929-31. In the latter year he lost his seat in the Labourite defeat, and resumed his association with the Co-operatives. He was re-elected to parliament in 1935, and in 1940 Churchill renamed Alexander first lord of the admiralty.

After Churchill's dissolution of the coalition government in May 1945, Alexander resigned from the cabinet. In his campaigning on the Labourite ticket in the general elections, he assailed Churchill as a "stooge" for reactionary interests. On Aug. 3, 1945, Prime Minister Attlee renamed Alexander to head the admiralty.

In the summer of 1946, Alexander temporarily replaced Foreign Minister Bevin, who was in ill health, at the 21-nation peace conference in Paris. He repudiated soviet charges that the U.S. and Britain were attempting to use undue influence on former axis states.

In the sweeping plans for reorganization of Britain's army, navy and air force, Prime Minister Attlee created a new ministry, Oct. 4, 1946—the ministry of defense—and appointed Alexander at its head with control of the three armed services.

Alexander, Viscount

Viscount Alexander of Tunis (Harold Rupert Leofric George Alexander) (1891-), British army officer and statesman, was born Dec. 10, 1891, in County Tyrone, Ireland. The 3rd son of the 4th earl of Caledon, he was educated at Harrow and at the Royal Military college, Sandhurst. He entered the regular army in 1911 as a second lieutenant. Among the first contingent of the "Old Contemptibles" to be shipped to France during World War I, Alexander commanded a regimental battalion, was twice wounded in action and won the D.S.O., the M.C. and the Legion of Honour. After serving in a number of high military posts in Britain and India, he returned to England in 1938 and again went overseas to France as commander of the British 1st division, at the outbreak of World War II. Later, he helped to organize the successful British evacuation (May-June 1940) from the Dunkirk beaches. In Feb. 1942, he was made commander of the British army in Burma. Again forced on the defensive, he beat a hasty retreat to India. The following summer he was transferred to Egypt, where he was appointed commander in chief of British Imperial forces in the middle east (Aug. 18, 1942). Under his over-all direction, the British 8th army chased Marshal Rommel's Afrika Korps out of Egypt and Libya. In Feb. 1943, Alexander was appointed Gen. Eisenhower's deputy and field commander of all Al-

lied armies in North Africa. He helped to plan the strategy for the Sicilian and Italian invasions in 1943. Gen. Alexander was promoted to the rank of field marshal June 4, 1944, and on Nov. 26, his appointment as supreme commander of the Mediterranean theatre was announced. In Feb. 1945, Marshal Alexander attended the Yalta conference and in May 1945, he accepted the surrender of German troops in northern Italy. During the controversy that arose over Trieste, Alexander challenged the authority of unilateral Yugoslav occupation of the city and nearby disputed areas. On July 31, 1945, he was appointed by King George VI as governor-general of Canada, succeeding the Earl of Athlone. Alexander, who had been made a baronet in 1942, was elevated to the peerage, Jan. 1, 1946, as Viscount Alexander of Tunis. He assumed his post as governor-general of Canada, April 12, 1946.

Alexei

Patriarch Alexei (Sergei Vladimirovich Simansky) (1877—), Russian ecclesiast and patriarch of the Russian Orthodox Church, was born Oct. 27, 1877, in Moscow. A graduate of the Moscow University law school, 1899, he attended the Moscow Ecclesiastical seminary and was graduated from the latter school in 1904 with a degree of doctor of theology. While still at the seminary, he was made a deacon (1902), assumed the name Alexei and became a priest the following year. Alexei, who was ordained a bishop in 1913, served as archbishop of Novgorod, 1932–33, and metropolitan of Leningrad, 1933–43. He was made metropolitan of Leningrad and Novgorod in 1943.

After the German invasion in 1941, Stalin, in his efforts to rally all soviet citizens to the defense of the fatherland, relaxed his opposition to the church and put a quietus on the activities of atheist organizations, particularly the "Godless League." These moves facilitated resumption of religious activities in Russia and Sergei, Alexei's predecessor as patriarch, urged the faithful to join wholeheartedly in the country's efforts to repel the invaders. This policy was continued by Alexei, who remained in Leningrad during the siege to organize the church in support of the red army. He was decorated for these services by the soviet government. In 1943, Alexei was made a permanent member of the Holy Synod.

After the death of Sergei in 1944, Alexei was named acting patriarch of the Russian Orthodox Church. On this occasion, he warmly renewed the church's pledge of loyalty and in a letter to Stalin, he wrote: "Most revered and dear Joseph Vissarionovich, I ask you to accept these assurances and believe in the feeling of profound love and gratitude to you with which all the church workers, guided by me, are now inspired."

Alexei was unanimously elected patriarch by the council of bishops that convened in the Sokolniki cathedral in Moscow Feb. 2, 1945. Some three months later (May 12), he was quoted in the newspaper *Izvestia* as saying that the Orthodox Church's principal achievement of the war was to "display to the world its complete unity with the government."

Alfalfa

The alfalfa crop grew steadily in favour among U.S. farmers during the decade 1937–46. In the ten-year period prior to 1937, an average of about 12,000,000 ac. was grown, and production averaged nearly 25,000,000 tons of hay. Acreage began to increase in 1940, when it reached

13,903,000 ac. and produced a crop of 30,578,000 tons. Increases occurred again in 1941 and also in 1942 when 15,814,000 ac. returned a record crop of 36,478,000 tons. There was a slight decline in acreage in 1944 and 1945, but the crop continued above average because of good yields.

The production of alfalfa seed began to increase in 1939, when more than 1,013,000 ac. were harvested and a record crop of 1,515,000 bu. obtained. The acreage declined in the period 1940–42 and rose again somewhat in 1944 but not to the record of 1939. The farm price of seed was only \$8.76 per bu. in 1940, but rose to \$20.22 in 1944 and to \$21.00 in 1946. The leading states in alfalfa seed production were Kansas, Oklahoma and Nebraska, with Arizona, Idaho, Montana, Minnesota and Utah next in order on the average.

Prices for alfalfa hay increased after 1928, when the farm price averaged only \$7.86 per ton. The rise was steady until early in 1946 it averaged \$18.00 per ton. No. 1 baled alfalfa at Kansas City rose from \$14.00 per ton in 1938 to more than \$30.00 per ton in 1946. Prices varied widely between regions, being \$9.72 per ton in the west north central region in April 1946, compared with \$22.50 in the south Atlantic states and \$19.90 on the Pacific coast. The declining numbers of dairy and beef animals began to show in the reduced market demand, offset to some extent by the shortage of feed grains. The production of all hay for the country as a whole was high relative to the number of livestock to be fed. The need for more hay of high-feeding quality was felt particularly in the southeastern states, and the U.S. department of agriculture urged an increase in this region in 1946 while suggesting a total hay acreage only 5% above the 1937-41 average. It was estimated that hay and pasture accounted for more than 50% of the feed of livestock. Alfalfa had come to be considered the most important not only because of its high feed value but also because of the beneficial effect on the

U.S. Alfalfa Hay Production by Leading States, 1937-46
(In millions of tons)

		• • • • • • • • • • • • • • • • • • • •						
	1937	1939	1941	1942	1943	1944	1945	1946*
U.S.Total	26.9	26.8	32.3	36.4 .	32.5	31.8	34.4	31.8
California	3.0	3.2	3.1	3.4	3.8	4.1	4.3	4.6
Minnesota	2.5	2.4	2.7	3.1	3.0	2.0	1.9	1.9-
ldaho	1.9	1.8	1.9	1.8	1.8	1.8	1.9	2.0
lowa	1.8	1.7	2.4	3.0	2.7	2.0	1.8	1.6
Nebraska	.6	.9	1.1	1.5	1.4	1.8	1.9	1.7
Michigan	1.8	1.6	1.8	2.2	1.9	1.7	1.9	1.4
Wisconsin	1.7	1.9	2.6	2.8	2.1	1.6	2.1	1.5
Kansas	ه.	ه.	1.2	1.6	1.4	1.6	1.7	1.5
Montana	.9	1.8	1.2	1.2	1.1	1.1	1.9	2.0
Colorado	1.2	1.1	1.3	1.3	1.3	1.4	1.3	1.2
Illinois	ه.	1.0	1.3	1.4	.9	1.0	1.2	1.2
Utah	1.1	.8	1.0	.9	.9	1.0	.9	.8
Ohio	.9	1.0	.9	1.1	.8	.7	.9	-8
Washington	.9	.7	.8	.7	.8	.7	.8	.8.
Missouri	.3	.4	.8	.9	.8 .7	.8	.8 .7	.8 .7
Oregon	ه.	.6	.7	.7	.6	.6	.6	.6
Oklahoma	.4	.2	.6	.6	.4	.6	Ī	.6
Arizona	.4	.8	.4	.4	.5	.6	.6	.6
Kentucky	.2	.3	.3	.4	.3	.3	.6	.5
Pennsylvania	.4	.3	.5	.5	.4	.5	.6	.5

The harvesting of hay was handicapped by the scarcity of iron wire bale ties in 1945 and 1946. Limitations of the raw metal to manufacturers so restricted the output of the ties that many farmers could not use their hay balers. The use of modern machinery rapidly changed the methods of handling hay at harvest, and a large part of the crop now was baled in the field as it was cut. New hay-drying ventilating systems were installed in barns to hasten the curing

*Preliminary estimate (subject to revision in 1947).

of the hay and improve its feeding quality.

This is particularly important with alfalfa, to conserve the leaves.

(See also HAY.) (J. C. Ms.)

Alfonso XIII

See Alphonso XIII.

Algeria

See French Colonial Empire.

Alien Property Custodian

See WAR AND DEFENSE AGENCIES.

Aliens

In the United States, the permanent quota limit law of 1924 remained in effect throughout the decade 1937-46; it allotted an annual quota to various designated nationalities, more than 95% European. The act administered by the commissioner of the immigration and naturalization service of the U.S. department of justice, specified three general classes of aliens for admission to the United States: (1) quota immigrants; (2) immigrants not subject to numerical (i.e., quota) limitation; and (3) nonimmigrants admitted for temporary stay. The quota provisions were based upon "national origins" as defined in the law. National origins were determined on the basis of the nationality composition of the total white population as enumerated by the census of 1920. To determine the origins of the various groups in the population, examination was made primarily of statistics of immigration and emigration and of census reports. The accompanying table

Annual Quotas, and Quota Aliens Admitted, 1939 and 1945, by Countries or Regions of Birth and by Sex.

Nationality or	Annual	Quota im admit	migrants
country of birth	quota	1939	1945
All countries	153,879†	62,402	11,623
Great Britain and Northern Ireland	65,721	2,828	3,182
England		2,096	2,400
Scotland		506	419
Wales		72	87
Northern Ireland		154	276
Germany	27,370	32,759	1,190
Eire	17,853	1,418	232
Poland	6,524	6,512	1,122
Italy	5,802	4,155	268
Sweden	3,314	324	<i>57</i>
Netherlands	3,153	637	99
France	3,086	81 <i>7</i>	159
Czechoslovakia	2,874	2,716	276
Soviet Russia	2,712	1,727	341
Norway	2,377	465	100
Switzerland	1,707	605	52
Belgium	1,304	307	79
Denmark	1,181	282	98
Hungary	869	1,087	117
Yugoslavia	845	850	177
Finland	569	461	.53
Portugal	440	404	418
Lithuania	386	365	78
Rumania	377	499	215
Greece	307	381	218
Spain	252	253	182
Latvia	236	223	43
Estonia	116	107	16
Albania, Bulgaria, Danzig, and Luxembourg—each	100	403	31
Other Europe†	500	193	146
Asia	1,754	835	473
Western Hemisphere†		419	1,967
Other quota regions†	1,850	370	234
Sex { Male: · · · · · · · · · · · · · · · · · · ·		31,699	4,725
Female		30,703	6,898

*Includes aliens to whom visas were issued during the latter part of the preceding

rections allens to whom visas were issued auring the latter part of the preceding year which were charged to the quota for that year.

†Quota for colonies, dependencies, or protectorates included with allotment for the European country to which they belong. The annual quota for 1939 was 153,774. Addition of 105 on Feb. 8, 1944, accounts for the annual quota total of 153,879 listed above. On July 4, 1946, an additional 50 was allotted to the quota for the Philippine Islands. With this latter revision the total for all countries becomes 153,929.

lists the annual quotas under the Immigration act of 1924, and the number of quota aliens admitted to the United States during the two fiscal years 1939 and 1945.

Registration.—The registration of aliens in 1940 provided the United States government with a detailed inventory of its alien population. With the exception of government officials and members of their families, all aliens 14 years of age and over who were in the United States on Aug. 27, 1940, and remained in the country for 30 days or longer were required to be registered and fingerprinted by Dec. 26, 1940. After that time aliens entering the United States for 30 days or more were registered and fingerprinted before admission. Aliens entering for less than 30 days were not required to be registered and fingerprinted, but if after arrival they remained more than 29 days such action had to be taken. Generally, registration and fingerprinting in the United States or at ports of entry were conducted by designated employees of the immigration and naturalization service. United States consular officers were authorized to register and fingerprint aliens abroad who applied for visas.

Registered resident aliens were required to notify the service in writing of each change of address within five days of the date of change. Aliens who entered the United States temporarily as students, visitors or otherwise than for permanent residence were required to give notice in writing of their address in the United States at the expiration of each three months' period.

As of Dec. 26, 1940, there were 5,009,857 registered aliens in the United States, Alaska, Hawaii, Puerto Rico and the Virgin Islands of the United States. This figure was the result of the registration which began Aug. 27, 1940, and continued through Dec. 26 of that year. An estimate based upon the alien registration records for the initial registration period indicated that on June 30, 1945, there were 3,050,000 resident aliens. Net migration, naturalization and mortality factors were used in making the estimate.

As of June 30, 1945, it was estimated that the median age of the alien population was 53 years. This was an estimated increase of 5 years over the median of 48 years indicated by the 1940 registration. During the same period, according to the U.S. census bureau, the estimated median age of the total population increased from 29 years in 1940 to 29.7 in 1945. The disproportion of certain age groups among the alien population, when compared with the general population, was illustrated particularly in the very young and the older age groups. Persons under 20 constituted 34% of the total population, but only 3% of the alien population. At the other extreme, those 45 years of age and over made up 27% of the general population, but 58.5% of the alien population.

Almost 75% of the registered aliens were born in Europe. Twenty per cent came from neighbouring countries in North and Central America, and the remainder from South America, Africa, Asia and the islands of the Pacific. Listed below are the main countries in order of rank for registered aliens according to country of birth, as of Dec. 26, 1940 (figures to nearest thousand):

Italy, including Sicily and Sardinia.703Canada.467Poland.446Mexico.424Purplic including Pusis in Asia.
Russia, including Russia in Asia370
Germany321
Great Britain, including England, Scotland
and Wales300
Austria194
Eire 160
Hungary118
Sweden
Japan 93
Lithuania
Philippine Islands
Greece 83

In 1940 some 80% of the registered aliens were living in the following ten states (figures to nearest thousand): New York, 1,258; California, 542; Pennsylvania, 370;



Japanese truck gardeners weeding onions at a relocation centre in California during 1943

Massachusetts, 364; Illinois, 325; Michigan, 303; New Jersey, 279; Texas, 214; Ohio, 203; Connecticut, 158. The registration data revealed a high concentration of aliens in urban centres.

One-third of the total was located in the five largest cities—New York, Chicago, Philadelphia, Los Angeles and Detroit. Almost 70% were concentrated in urban centres of more than 50,000 population.

Of the approximately 5,000,000 registered aliens, 13% arrived during the 1930s and 27% during the previous ten years. More than 70% of the total had arrived in the United States before 1924. The estimated median duration of residence in the country was 25 years. An estimated 734,000 were illiterate, two-thirds of whom were women.

The percentage of illiteracy rose sharply among those 45 years of age and older. The total noncitizen population of the country consisted of 2,341,000 males and 2,669,000 females. Hence, there were 88 males for every 100 females.

Naturalization.—For the nine fiscal years 1937 through 1945, a yearly average of 147,000 declarations of intention—first citizenship papers—were filed. The four prewar years through 1940 accounted for a 172,000 yearly average, and the average for the five war years 1941 to 1945 was 127,000 per year. This decrease occurred principally in

the years 1944 and 1945, when the figures were the lowest since statistical records of naturalization were begun by the federal government in 1907.

Petitions for naturalization averaged 261,000 per year for the nine-year period, 208,000 yearly for the four prewar years, and 304,000 for 1941 to 1945. Petitions filed totalled approximately 900,000 for the years 1943, 1944 and 1945.

Except for slight decreases in 1938 and 1943, the number of persons naturalized each year increased considerably between 1937 and 1944. The figure of 442,000 for 1944 was the highest recorded, but the following year there was a decrease to 231,000. For the nine years 1937 through 1945, the yearly average of persons naturalized was 255,000. Of the 992,000 naturalizations covering the years 1943–45, 109,000 were granted to members of the U.S. armed forces.

Provisions in the Second War Powers act, approved March 27, 1942, made available an expeditious naturalization procedure to noncitizen members of the United States armed forces during World War II. The statute provided a judicial naturalization process for those residing within the jurisdiction of a naturalization court, and an administrative process for those serving outside the country. Although most of the naturalizations took place in the state and territorial courts of the United States, approximately 14,000 occurred outside the United States. Citizenship was conferred on this latter group by designated representatives of the immigration and naturalization service under procedure which for the first time authorized the granting of naturalization under the administrative process. The naturalizations indicated took place between Dec. 1, 1942, and June 30, 1945, in the following areas (figures to nearest thousand):

Great Britain and Northern Ireland	o
North Africa	2
New Guinea .	2
Other Pacific	2
Italy	1
France	1
Asia	1
Australia and New Zealand	7

Other areas where this type of naturalization occurred were: Panama Canal Zone, Iceland, Canada, Caribbean area, South America, Greenland, Belgium, Newfoundland, other Africa and Bermuda.

Aliens of enemy nationality could be naturalized under prescribed safeguards. The case of each alien enemy applicant for naturalization was thoroughly investigated by the immigration and naturalization service, and favourable recommendations were made only where loyalty was established without question. Naturalizations for alien enemies, compared with the total naturalizations of aliens from all countries, follow:

Alien enemy	941	1942	1943	1944	1945
naturalizations 8: Percent of total			61,919	191,273	97,322
naturalizations Total naturalizations27	29.4 7,294	13.7 270,364	19.4 318,933	43·3 441.070	42 1 231,402

There were approximately 2,300,000 naturalizations for the years 1937 to 1945. The principal nations to which most of these new citizens formerly owed allegiance (figures in thousands) were: British empire, 583; Italy, 363; Poland, 260; Germany (including Austria), 256; U.S.S.R., 159; Czechoslovakia, 83; Sweden, 58; Yugoslavia, 57; and Hungary, 54.

Alien Enemies.—Under the Nationality act of 1940, alien enemies included natives, citizens, denizens, and

subjects of the countries against whom the United States had declared war. These countries were Japan, Germany. Italy, Hungary, Rumania and Bulgaria. Aliens of enemy nationalities at the outset of the war numbered almost 1,275,000 or one-quarter of the entire alien population. Those of Italian nationality numbered 703,000; Germans, 321,000; Hungarians, 118,000; Japanese, 93,000; Rumanians, 33,000; and Bulgarians, 5,000. By authority of presidential proclamations of Dec. 7 and 8, 1941, and Jan. 14, 1942, a series of regulations was promulgated by the department of justice affecting the conduct of citizens or subjects of Japan, Germany and Italy, 14 years of age and older. During Oct. 1942, aliens of Italian nationality, except those already interned or under parole, were excepted from the regulations for alien enemies by order of the attorney general.

The regulations which affected aliens of German and Japanese nationalities placed restrictions on their travel and prohibited them from owning certain articles, such as cameras, short-wave receiving and transmitting sets and firearms. They were not permitted to make any air flights, or to change their places of residence or employment without notifying the authorities. The regulations re-

sion. Such aliens were interrogated by Alien Enemy Hearing boards to determine whether they should be interned for the duration of the war, paroled, or released unconditionally. The regulations of Dec. 7 and 8, 1941, relating to the possession of certain prohibited articles and to travel within the borders of the United States, were revoked by the president on Dec. 12, 1945.

Dangerous alien enemies ordered interned by the attorney general were kept in internment camps operated by the immigration and naturalization service. From the beginning of U.S. participation in the war until Aug. 1945, 24,886 aliens of enemy nationality were included under alien enemy proceedings. Early in 1941, the wartime internment program was begun with the detention of crew members of the scuttled German steamship "Columbus" and of Italian seamen apprehended for, or to prevent,



sabotage to their ships in U.S. ports. As a result, three internment camps were in operation when the United States entered World War II. When the principal breadwinner was interned, his family frequently requested to be interned with him. This was allowed if careful investigation indicated that internment was in the best interest of the family. One of the camps, at Crystal City, Tex., was used for the detention of internees and their families. In May 1945, it included 3,326 persons, almost half of them children. All civilian alien enemy internees originally in the custody of the army were transferred to the jurisdiction of the immigration and naturalization service by June 1943. A total of 4,120 internees were affected by the transfer. Of the 9,220 alien enemies detained at the end of the fiscal year 1943, 5,988 came from continental United States and Puerto Rico, 2,349 from Latin America, and 883 from Alaska, Hawaii and other Pacific islands.

During the fiscal year 1945, the population of alien enemy detention camps increased from the 1944 figure of 6,238 to 7,364. In the same period, 1,658 were released from the camps, compared with 5,528 released during the previous year. Of this number, 792 were repatriated, 627 paroled, 119 discharged, 88 interned at large and 32 died. During 1945, of persons interned, 5,211 were Japanese, 2,107 German, 25 Italian, and 21 of the other enemy nationalities. Of the total, 1,120 were persons who applied for internment to join husbands or fathers in one of the family internment camps; 3,015 were persons apprehended under presidential warrants; 1,956 were persons brought to continental United States from Alaska and Hawaii; and 532 were seamen who had been members of crews of enemy merchant vessels taken into custody in ports of the United States.

U.S. Legislation.—The act of May 14, 1937, placed restrictions on nonquota and preference-quota immigrants. Certain immigrants were excepted from exclusion from the United States, and deportation was directed for aliens who had obtained visas through fraudulent marriage.

The act of June 25, 1936, relaxed the requirements for naturalization as to continuous residence for aliens absent from the country during employment by the United States government, an American institution of research, or an American concern engaged in promotion of foreign trade and commerce of the United States. The procedural requirements for obtaining this exemption were made more stringent by the act of June 29, 1938. The act of Aug. 9, 1939, extended similar benefits to aliens absent in the capacity of clergymen.

The act of July 27, 1939, provided for return of Filipinos to the Philippine Islands at United States expense (similar statute, July 10, 1935).

On June 28, 1940, the Alien Registration act of 1940 was passed. This act prohibited subversive activities such as urging disloyalty and advocating the overthrow or destruction of the government of the United States. It provided additional grounds for the exclusion and deportation of aliens. Permission was granted in certain deportation cases for aliens of good moral character to depart voluntarily in lieu of deportation, or to obtain suspension of deportation if such action would result in serious economic detriment to members of the families. Title III of the act provided for the registration and fingerprinting of aliens in the United States and of those seeking to enter.

The act of July 2, 1940, extended the privilege of repatriation to native-born American women who had lost United States citizenship by marriage to aliens prior to

Sept. 22, 1922, whose marital status had not terminated, but who had resided in the United States continuously after their marriage.

Another act of July 2, 1940, allowed naturalization, without a declaration of intention, of an alien who had entered the United States before his 16th birthday and who had filed his petition for naturalization before his 22nd birthday.

The act of Aug. 16, 1940, provided exemptions from the normal residence and certificate of arrival requirements to soldiers serving in the regular United States army.

The Nationality act of 1940 (Oct. 14, 1940) was a codification and revision of existing laws. It provided that certain persons who lost their citizenship by entering or serving in the armed forces of a foreign state were entitled to enter the United States as nonquota immigrants for the purpose of recovering their citizenship; and specified that a former citizen of the United States, expatriated solely through the expatriation of a parent, need not comply with the requirements of the immigration laws if he returned to the United States before the age of 25 years.

The nationality provisions included the following major innovations: (1) provision for appointment by the commissioner of designated naturalization examiners to hear testimony for the courts and extension of the system to state courts; (2) liberal exemption from some naturalization requirements for persons serving in the armed forces and on vessels; (3) reduction of the required waiting period after filing the petition for naturalization from 90 days to 30 days, and increase from 30 days to 60 days of the period immediately preceding general elections when naturalization was prohibited; (4) authorization for naturalization of natural children and adopted children on petition of the citizen parent or parents; (5) expansion of the categories of persons eligible for naturalization by permitting naturalization of descendants of races indigenous to the western hemisphere; and (6) authorization by the commissioner of immigration and naturalization to prescribe the nature and scope of examinations of petitioners for naturalization with respect to their understanding of and attachment to the fundamental principles of the constitution.

The act of June 21, 1941 (amending the act of May 22, 1918), related to the prevention of departure from and entry into the United States in time of war.

Title X of the Second War Powers act of March 27, 1942, provided a simplified procedure for the naturalization of noncitizens serving in the armed forces during World War II, including provisions for administrative naturalization for those stationed outside the United States.

The act of April 2, 1942, extended to former citizens who had lost citizenship by reason of service in the armed forces of one of the Allies during World War II, an expeditious method of naturalization. Persons in this category could become naturalized by taking the prescribed oaths before any diplomatic or consular officer of the United States abroad.

The acts of April 29, 1943, Dec. 23, 1943, Feb. 14, 1944, June 28, 1944, Dec. 22, 1944 and July 3, 1945, authorized the importation of agricultural and other labourers from the western hemisphere for employment for a limited wartime period. The acts further provided for the transportation, maintenance and other expenses in connection with their importation. Provisions of the immigration laws relating to aliens generally were waived in behalf of such labourers.

The act of July 13, 1943, amended the Immigration act

of Feb. 5, 1917, in order to relax, during the time the United States was at war, normal requirements as to places to which an alien could be deported. It provided that under certain conditions an alien was deportable to the country where his recognized government-in-exile was located, or to a country proximate to the one of which the alien was a citizen or subject, or, with the consent of the country of which the alien was a citizen or subject, to any other country.

An important measure was the repeal on Dec. 17, 1943 of the Chinese Exclusion laws. This legislation originated in 1882 and had been retained on the statute books for 61 years, during which time it was subjected to many amendments and revisions. The congressional action in 1943 permitted a small number of the Chinese people to enter the United States for immigration purposes. The new legislation also removed the previously established prohibitions against naturalization of persons of the Chinese race as U.S. citizens, and established a yearly immigration quota for Chinese persons of 105.

The act of Jan. 20, 1944, amended the Nationality act of 1940 to provide that United States citizenship lost through desertion from the armed forces could be regained by restoration to active duty with such forces in time of war. This act further amended that statute so as to make certificates of citizenship available to persons who acquired that status at birth outside the United States, its territories, and possessions, or at birth on or after Jan. 13. 1941, in an outlying possession of the United States.

On July 1, 1944, congress consolidated and revised the laws relating to the public health service, which included the care and treatment of seamen, examination of aliens, quarantine and the use of immigration station hospitals. The act also provided for hospital treatment of alien convicts who were narcotic addicts and for release therefrom to this service of those entitled to discharge and subject to deportation.

The act of Sept. 27, 1944, further amended the Immigration act of Feb. 5, 1917, by adding to the classes of excludable aliens, persons who had departed from the jurisdiction of the United States to evade training or service in the armed forces during time of war or during a time declared to be a period of national emergency. It also provided for loss of nationality by any national of the United States who departed or remained outside the jurisdiction for such purpose.

The act of Sept. 28, 1944, increased the fees for filing declarations of intention and petitions for naturalization and eliminated the fee for a certificate of arrival.

The act of Dec. 19, 1944, eliminated in certain cases the liability of transportation companies to fines and penalties for bringing aliens to the United States without proper documents.

The act of April 30, 1945, provided for the imposition of severe penalties on any person guilty of procuring or attempting to procure the escape of any prisoner of war or interned alien enemy held by the United States or any of its allies.

The act of Oct. 29, 1945, amended the Immigration act of 1924 by adding to the classes excluded on the ground of ineligibility to citizenship, certain aliens of neutral countries who applied for relief from training and service in the armed forces of the United States.

The act of Dec. 28, 1945, expedited the admission to the United States of alien spouses and children of citizen members and former members of the armed forces by exempting them (for a period of three years) from the usual documentary requirements and from exclusion on

the ground of certain physical and mental defects as listed in the act of Feb. 5, 1917.

The act of Dec. 29, 1945 (International Organizations Immunities act), added to the classes of nonimmigrants, foreign government representatives to certain international organizations, the personnel of such organizations and their immediate families. In addition, the statute granted to such persons the same privileges in connection with entry into and departure from the United States as those accorded to officers and employees of foreign governments. (U. C.)

Great Britain.—The control of aliens in Great Britain continued to rest on the Aliens Restriction act, 1914, and the Aliens Restriction (Amendment) act, 1919; but the effective instrument was an order in council, the Aliens order, 1920. All aliens, with certain limited exceptions, e.g., diplomats and members of Allied forces, were registered with the police and were issued a certificate containing a photograph and particulars of residence, occupation and nationality.

	Registration of Aliens in	Great Britain	
	1933	1937 1939	1946
Austrian	4,344	11,849 11,989	16.485
Belgian	4,940	4,685 4,207	11,438
Czechoslovak	1,274	2,123 7,930	10,171
Dutch	5.086	5,607 5,668	16,286
French	12.785	13,195 11,613	13,582
German		20,986 62,244	37,824
Italian		20,950 19,127	16.755
Polish		6,181 8,776	20,226
U.S.A	13.579	14,421 13,665	12,605
Others	92,385	93,656 92,855	109,404
Total:	174,243	193,653 238,074	264,776

The German (nazi) government created 500,000 potential Jewish refugees and the occupation of Austria a further 200,000. Great Britain was not an immigrant country, but temporary refuge was given to those in immediate danger. In Sept. 1939, the 122 tribunals set up to examine enemy aliens dealt with 71,553 persons and classified 55,600 as "refugees from nazi oppression." Czechs were treated as friendly aliens. A special Czech tribunal dealt with 10,469 Czechs, recommending internment in one case only, and the imposition of special restrictions in another.

There was no general internment of enemy aliens until May 1940. Between May 12 and July 24, internment of Germans and Austrians was carried out in three stages, beginning with those in the coastal belt and those subject to special restrictions. The total number of persons interned, including Italians, Japanese and nationals of other axis satellites, was 27,568. The policy was a temporary one to meet a threatened invasion, and on Aug. 1, 1940, a White Paper was issued specifying categories of eligibility for release. The grounds fell broadly into three classes: age, ill-health and usefulness for national service. The effect was to place on the internee the onus of justifying his claims to liberty. The following table shows the position in May 1946:

·										Germans and Austrians	Italians	Others	Totals
Still interned										21	4		25
Died in internment			٠		٠					242	473	4	719
Repatriated		٠								1,194	200	148	1.542
Released	•	•	٠	•	•	٠	•	•	٠	20,510	4,155	617	25,282
										21.967	4.832	769	27.568

Between 1937 and 1946, 2,585 deportation orders were made, an average (excluding 1940 when the number was 1,099) of 165 orders per annum. Persons actually deported numbered 1,054; 1,450 persons against whom deportation orders were made were detained, on grounds of public security or order, when deportation was impracticable.

This wartime provision of the Aliens order was withdrawn in Dec. 1045.

The Allied governments in exile and their officials were granted diplomatic status by the Diplomatic Privileges (Extension) act, 1941. The Allied Forces act, 1940, authorized the exercise of powers of discipline and internal administration by the Allied commands, and the Allied Powers (War Service) act, 1941, the conscription of Allied nationals. The Alfied Powers (Maritime Courts) act, 1941, set up maritime courts for the discipline of merchant seamen. The United States (Visiting Forces) act, 1942, took U.S. forces outside the jurisdiction of British courts.

Between 1937 and Nov. 1940, when naturalization was suspended, 8,046 certificates were granted. British-born women married to enemy aliens and widows and persons whose naturalization was required in the national interest were exceptions to the suspension policy, and 4,421 certificates were issued under one or other of these exceptions. After naturalization of other applicants was resumed in Nov. 1945, 2,151 certificates had been issued up to mid-Oct. 1946. Under the British Nationality and Status of Aliens act, 1943, Frenchmen serving in the British forces were eligible for naturalization under special arrangements. (See also Census Data, U.S.; Immigration and Emigration; War and Defense Agencies.) (W. B. L.)

Alimentary System, Disorders of

Adequate treatment of oesophageal lesions continued to be a challenge to the medical profession during the decade 1937-46. Difficulties in the diagnosis of oesophageal lesions were emphasized by M. Loeper, Mlle. Riom and P. Perreau, who pointed out that such widely divergent symptoms as paralysis of a vocal cord and cardiovascular disturbances may be secondary to lesions of the oesophagus. If the intercostal nerves and the sympathetic nervous system are involved, vascular and ocular disturbances, severe pain and anomalies of the production of sweat will be present. The most common symptom in oesophageal lesions is trouble with swallowing. Pain, however, may be one of the earliest manifestations of oesophageal disease, and if it is not then accompanied by difficulty in swallowing, it may prove to be misleading. An obstacle to the clear understanding of the importance of oesophageal pain continued to be the lack of knowledge concerning the nerves that control the oesophagus. The upper portion of the oesophagus is supplied by the recurrent laryngeal nerves and the lower portion by the oesophageal plexus formed by the intermingling of the right and left vagus nerves. H. J. Moersch and J. R. Miller pointed out that the vagus nerve has communications with the glossopharyngeal nerve, the spinal accessory nerve and the first and second cervical nerves, that the vagus fibres are next to the descending tract of the trigeminal nerve and that a somatic sensory branch of the ganglion nodosum of the vagus innervates the external auditory canal. Sympathetic nerve fibres having their origin from the inferior cervical ganglion and the first to ninth thoracic sympathetic ganglia also serve to convey painful stimuli from the oesophagus. Although the phrenic nerve does not directly supply the oesophagus, this nerve may, because of the close relationship between the oesophagus and diaphragm, serve to transmit painful stimuli. Knowledge of these facts made the many areas in which pain is felt related to the oesophagus understandable. In general, oesophageal pain depends on the state of tension of the oesophagus. The character of such pain varies widely; the more severe it becomes, the wider is its distribution. Pain caused by disturbances in the upper portion of the oesophagus is more likely to be situated over the thorax at a point corresponding to the underlying oesophageal lesion. Disturbances in the lower portion of the oesophagus give rise to a much more diversified distribution of the pain.

F. C. Lendrum studied the oesophagus in cases of spasm at the lower end and found a striking loss or complete absence of ganglion cells from the myenteric plexus of nerves. After the destruction of this plexus, sympathetic fibres to the terminal portion of the oesophagus act without opposition; the terminal part of the oesophagus then does not relax normally with the swallowing reflex and inability to swallow results. To explain the varying anatomic pictures, Lendrum introduced the term "compensated" and "decompensated" cardiospasm (spasm of the lower end of the oesophagus). In the presence of early and moderate cardiospasm, the oesophagus dilates only slightly and compensates for the increased internal pressure by thickening of the walls; long-continued severe pressure, however, overcomes this resistance and the oesophagus dilates prodigiously and stretches lengthwise.

The treatment of varicose veins in the oesophagus made significant progress. D. M. Juzbašić proposed the interruption of all venous afferent tracts traversing the small omentum, interruption of similar tracts from the region of the spleen and the performance of a modification of the Talma operation to facilitate the discharge of the blood from the portal vein into the vena cava. H. J. Moersch reported the successful obliteration of oesophageal varices by the injection of a sclerosing substance guided by endoscopic visualization.

The successful treatment of carcinoma of the oesophagus continued to be a difficult problem to both the physician and the surgeon. The advent of chemotherapeutic drugs and antibiotic agents made it possible to remove lesions of the oesophagus surgically, with incomparably less immediate risk than was formerly the case. Insufficient time had elapsed by the end of the decade to permit a satisfactory estimate of the ultimate results which might be expected from this difficult and radical procedure.

Stomach and Duodenum.-Much study of the physiology of gastric secretion was undertaken. Franklin Hollander pointed out that the secretion of the stomach wall is an isotonic solution of practically pure hydrochloric acid. The normal variations in the acid and neutral chloride concentrations of the juice of the fundic pouches are caused by a buffer-containing secretion which neutralizes and dilutes the fluid. This buffer secretion plays a major role as an intragastric agent in the normal control of gastric acidity, a role that is more important than duodenal regurgitation as an extragastric agent. C. M. Wilhelmj, F. T. O'Brien and F. C. Hill demonstrated clearly that the pyloric segment exerts a specific stimulating influence on the acid-secreting mechanism of the body of the stomach, and is thus of importance in the intragastric chemical phase of the secretion of acid. Basal gastric secretion was studied by A. L. Bloomfield, C. K. Chen and L. R. French. They found that there was no correlation between the level of gastric acidity obtained by stimulation with histamine in control cases, as compared with cases of duodenal ulcer. On the basis of their observations, it appeared that a basal acidity of more than 100 is almost positive evidence of the presence of duodenal ulcer, and that a basal acidity of more than 120 makes the diagnosis definite. The authors recommended study of basal secretion as a simple and informative procedure in respect to gastric secretion. Irving Ehrenfeld and Mills Sturtevant found that the

smoking of tobacco caused a significant increase in gastric acidity, lending support to the clinical observation of the harmful effect of tabagism in the course of symptoms of dysphagia. K. Westphal and H. Weselmann confirmed the fact that tobacco has an injurious effect on the stomach. They attempted to measure the extent of injury caused by nicotine to the gastric mucous membrane by its effect on the gastric cell count and by gastroscopic and roentgenoscopic examinations in the human being. They substantiated their findings by animal experimentation. Persons who have a labile vegetative nervous system particularly should be warned against the hazard of excessive smoking.

The experimental production of ulcer by the oral administration of cinchophen, and the subcutaneous use of a histamine-beeswax mixture, gave the physiologist useful tools for the advancement of understanding of the genesis and treatment of benign duodenal and gastric ulcer.

J. A. Roth and A. C. Ivy found evidence that caffeine and coffee taken orally are powerful stimulants of both the acid and pepsin content of the gastric juice in man and the cat. The intravenous or intramuscular administration of caffeine likewise provokes a copious flow of gastric juice. This work implied that the excessive use of caffeine-containing beverages may play a contributory role in the pathogenesis of gastroduodenal ulcer in man. The same workers found that caffeine and histamine have a synergistic effect in relation to gastric secretion; a similar synergistic effect was noted with respect to alcohol and caffeine.

An interesting approach to the problem of duodenal and gastric ulcer was made by D. J. Sandweiss and A. C. Ivy and associates. A substance derived from the mucosa of the small bowel called "enterogastrone" and a substance extracted from the urine called "urogastrone" were demonstrated to exert an inhibiting effect on the gastric secretion of experimental animals. These observations opened new avenues in the treatment of gastroduodenal ulcer. Much work still remained to be done, however, before any valid prediction of the worth of these substances in the treatment of the patient with ulcers could be made.

There was much interest and real advance in the understanding of the relationship to dyspepsia of diffuse gastric mucosal changes. This was primarily because of the development, to a high degree of perfection, of the flexible gastroscope. Much of the value of the gastroscopic examination, however, still rested with the skill and experience of the examiner. In recognition of this, attempts were made to render gastroscopic interpretation less subjective and more objective. M. J. Heilpern, O. Porges and H. Hofmann developed a small photographic apparatus which could be introduced into the stomach and which permitted the making of a photograph of the interior of the stomach. Later, Norbert Henning and Heinz Keilhack developed an apparatus which operated on the principle of a mirror reflex camera, which permitted better control and allowed for the making of photographs of selected areas of the gastric mucosa. The method had definite practical limitations, but commended itself to further development because of the aid it offered in teaching and also because it was the only method which resulted in an objective record to which later reference for comparative purposes was possible. Another refinement of the gastroscopic procedure was that which permitted the taking of specimens for biopsy from the areas visualized by the flexible gastroscope. The taking of a specimen for biopsy from the gastric mucosa had long been possible through the direct-vision rigid instrument, but the value of this method was necessarily restricted because much of the interior of the average stomach cannot be seen through the rigid instrument. Bruce Kenamore developed a workable attachment to the Wolf-Schindler gastroscope which permitted the taking of specimens for biopsy from both benign and malignant lesions. Should this instrument prove to be practical and safe, it would seem to give real promise as an aid in the recognition of small neoplastic gastric lesions.

Probably the most important contribution to gastroenterologic practice rendered by the agency of the gastroscope during the decade was clarification of the understanding of gastritis. The fact that gastritis exists and that it is an important cause of dyspepsia was generally accepted. Rudolf Schindler pointed out that gastroscopic examination may be extremely helpful in proper evaluation of the nature of a circumscribed gastric ulcer. He believed that the observations made at gastroscopic examination might be superior to inspection of the gross specimen, and might be equalled only by microscopic examination as a method of distinction between a benign gastric ulcer and a neoplastic one. Although this observation was perhaps somewhat optimistic, yet the gastroscope in expert hands had proved to be a useful tool in the recognition of early carcinoma of the stomach.

A. H. Douthwaite and G. A. M. Lintott examined the stomach gastroscopically after the ingestion of acetylsalicylic acid and dilute solutions of mustard. Marked inflammatory changes occurred in the gastric mucosa as a result of contact with these materials. Seymour Gray and Schindler carefully examined the stomach in a large number of chronically alcoholic persons and came to the conclusion that the prolonged use of alcohol seems to produce chronic gastritis in some persons but has no effect whatever on the stomachs of others, for reasons still unknown.

Numerous authors called attention to the fact that carcinoma of the stomach may simulate chronic diffuse gastritis. Opinion was divided as to the aetiologic role which gastritis plays in the genesis of carcinoma. E. S. Judd, Jr., in a careful pathologic survey of stomachs involved by carcinoma, found significant lesions in the mucosa at a distance from the tumour, suggesting that the entire mucosa is the host to the malignant process. It was his opinion that the mucosal changes commence long before the actual appearance of the carcinoma and that carcinoma develops in a previously damaged stomach, the antecedent injury having been present for a long time. In Judd's material the pathogenesis of carcinoma of the stomach seemed directly related to a disorganized hyperplasia of the mucous cells.

The decade saw general acceptance of the rationale of early feeding in the treatment of bleeding from the gastrointestinal tract. The convalescence of patients who have had massive bleeding from the gastrointestinal tract and who have been treated in this way was materially improved. The time-honoured method of prolonged starvation was all but discarded. Although the fatality statistics accompanying gastroduodenal bleeding varied widely and were often unreliable, it was generally accepted that it is best to treat massive bleeding from this source conservatively, because there are but few instances in which the bleeding does not cease spontaneously. Although there continued to be proponents for early surgical intervention in these cases, the over-all fatality statistics did not seem to be so favourable among patients so treated. Experience would suggest that a single gastroduodenal haemorrhage is rarely fatal, and that in persons of the younger age groups severe bleeding from this source is much less serious than it is in persons more than 50 years old. The liberal use of plasma and whole blood designed to restore the blood volume as

quickly as possible after haemorrhage had much to commend it. It was demonstrated that whole blood administered properly can be employed without increasing the liability to further bleeding. Most workers continued to prefer to transfuse repeatedly small quantities of blood—approximately 250 c.c.—than to use larger amounts. I. J. Wood advocated the continuous massive transfusion of whole blood by the continuous drip method, and thought that this method not only immeasurably shortened the convalescence, but that it could be used advantageously to prepare a patient rapidly for needed abdominal surgery. If the haemoglobin is restored to a nearly normal level in this way, a surgical operation can be performed safely which otherwise would be attended by a prohibitive risk.

Attention was drawn repeatedly to the fact that the blood urea may rise to a high value after massive gastro-duodenal bleeding. There was no consistent agreement as to the cause of this. There are, apparently, several factors which explain it, the most important being the presence of large amounts of blood in the digestive tract and a temporary decrease of renal function because of the diminished flow of blood through the kidney.

Although the most common source of massive bleeding from the digestive tract is a benign duodenal or benign gastric ulcer, the gastroscopist has shown that exsanguinating and even fatal haemorrhage can be caused by gastritis in the absence of any demonstrable associated lesion. Other common causes of severe bleeding are vascular lesions such as varicose veins, tumours of various types such as polyps and hemangiomas and, less often, malignant tumours.

In the treatment of benign ulceration of the stomach and duodenum, one of the sheet anchors is a diet which unfortunately proves to be deficient in essential vitamins. Since this deficient diet often is utilized for extended periods, a chronic state of avitaminosis is certain to exist, and although a frank deficiency state may not be clinically discernible, yet research in this field of metabolism indicated the wisdom of supplying supplementary vitamins in adequate quantity during the time a restricted diet is followed.

Numerous articles appeared during the decade on the problem of the neutralization of gastric acid. The importance of this was obvious when it is recalled that the approach to the treatment of gastroduodenal ulcer through the years had been primarily directed toward ablation of the gastric acid. Frederick Kellogg and S. R. Mettier noted that complete neutralization of the gastric acidity seriously interferes with the absorption of iron from the gastrointestinal tract, thus impeding recovery from an iron-deficiency anaemia. There was general recourse to preparations containing colloidal aluminum hydroxide or magnesium trisilicate in lieu of the time-honoured combinations of sodium bicarbonate, calcium carbonate and magnesium oxide. Colloidal aluminum hydroxide and magnesium trisilicate are not absorbed systemically in significant amounts from the gastrointestinal tract, and as a result they do not cause the serious manifestations of toxicity which may rise during the course of treatment with other

Colloidal preparations of aluminum hydroxide and magnesium trisilicate also proved their worth for persons who have associated renal disease that makes ordinary alkaline therapy prohibitive. Moreover, colloidal aluminum hydroxide lent itself to a particularly useful mode of utilization in that dilute solutions of this substance can be administered continuously by the drip method throughout a

24-hour period. This is accomplished by means of an indwelling nasogastric tube, thus assuring continuous neutralization of the gastric acid and permitting more rapid healing of an ulcer than was formerly possible, and also introducing a significant aid in the medical control of otherwise intractable lesions. Of the two drugs, colloidal aluminum hydroxide would appear to be the more efficient, but it, as well as magnesium trisilicate, has some undesirable features. These undesirable characteristics happily are neutralized by a combination of the two drugs. Colloidal aluminum hydroxide, in addition to its antacid effect, has a multiple mechanism which includes a slight astringent and demulcent property and an absorptive action on toxins; thus its value is enhanced, since it therefore combats three probable major factors in the pathogenesis of peptic ulcer: trauma, acid erosion and infection.

R. Schwenk made a critical review of reports on the histidine treatment of gastroduodenal ulcer. He also treated a series of patients with a histidine preparation. He concluded that histidine does not fulfil any of the requirements for an ulcer remedy, and that it should be disregarded in the therapeusis of ulcer. This observation was in keeping with the experience with this drug generally.

G. F. Dick and C. W. Eisele carried out an interesting observation in a study of 41 patients who had peptic ulcer. Instead of attempting to neutralize the gastric acidity with the antacid preparations generally favoured, they simply fed their patients at hourly intervals. Their data demonstrated that the healing of peptic ulcers would progress satisfactorily without the neutralization of gastric acidity with alkalies and that the speed of recovery achieved by this method compared favourably with that observed in any other type of treatment.

A serious attempt to combat the ulcer-producing factor by ablation of peptic activity was undertaken. S. J. Fogelson and D. E. Shoch suggested the use of a surface active agent such as sodium alkyl sulphate, but it was doubtful that this approach offered anything more than did the time-tried neutralization of the gastric acid which indirectly inactivates peptic activity, anyway.

The introduction of enzymatic hydrolysates of casein gave rise to their use in the treatment of peptic ulcer. The substances rapidly gained favour, but it was exceedingly doubtful that this form of treatment offered any more than did the time-tested modifications of the Sippy regime in which bland feedings frequently are given. These substances lend themselves to a ready means of administering large amounts of available protein, which may be particularly advantageous in some cases in which there have been massive haemorrhage or in which there is an associated state of malnourishment and a low intake of protein.

The surgical treatment of gastroduodenal ulcer was featured by an emphasis on partial gastric resection as a treatment of choice. Periodically there was a suggestion that ablation of the vagal effect would be a more nearly physiologic approach. Asher Winkelstein and A. A. Berg, and later L. R. Dragstedt and his co-workers placed renewed emphasis on vagotomy as a method of treatment. The results that they achieved thereby were so encouraging as to call for a thorough evaluation of the subject.

Carcinoma of the stomach, because of its frequency of occurrence, continued to demand real interest on the part of the gastroenterologist. The major emphasis was on refinements in diagnosis, leading to recognition of the lesion in an earlier stage of its development, thereby enhancing the chance of cure. The gastroscope improved the ability to recognize gastric carcinoma as a small lesion. Repeated

emphasis was given the importance of considering any circumscribed gastric ulcer to be potentially malignant, and to that of recognizing that no clinical sign or laboratory method gives any surety of the accuracy of the diagnosis in any particular case. Radical gastric resection remained, as formerly, the only method of treatment offering any hope of success in carcinoma of the stomach.

Biliary and Pancreatic Systems.—A continued search for a reliable test of hepatic function was manifest in the literature of the decade. Real progress was made in this field, although obviously an all-inclusive test of hepatic function had not yet been found, nor was it likely to be, because of the manifold functions of the liver. One of the most informative aids in the diagnosis of deep jaundice was a reliable method for determination of the patency of the common bile duct. Duodenal intubation had been a useful procedure, but as a method it had serious limitations. C. J. Watson showed that the quantitative estimation of the urinary and fecal output of urobilinogen gives the most reliable index of the patency of the extrahepatic bile ducts. The method is objectionable only because it is cumbersome, unpleasant and time-consuming. A later refinement was less difficult to perform from the standpoint of laboratory technic; it can be done more quickly than the more detailed quantitative determination, and gives a result which to all intents and purposes is as informative.

The introduction of the cephalin-cholesterol flocculation test was a significant addition to diagnostic aids with respect to hepatic disease. This test proved itself of decided value. It is not so much a measure of hepatic function as it is a measure of hepatocellular disease, as compared to some lesion involving the extrahepatic biliary system. Viewed in the light of this fact, it was apparent that one of its greatest fields of usefulness is in assisting in the proper classification of deep, painless jaundice.

Waltman Walters, J. M. McGowan, W. L. Butsch and P. A. Knepper made an important contribution to understanding of the mechanism of biliary colic, particularly in that type in which troublesome attacks of pain are unattended by any demonstrable lesion of the extrahepatic bile ducts. These workers demonstrated that the biliary colic of constipation after removal of the gall bladder was coincident with an increase in intraductal pressure, that the use of morphine often enhanced this and that the most logical drug to use from the standpoint of physiologic effect and clinical result was nitroglycerine. Nitroglycerine was demonstrated to relax the sphincter of Oddi, thus reducing the intraductal pressure and abolishing the pain.

The general use of vitamin K and an understanding of the mechanism by which it abolishes cholemic bleeding was one of the most highly significant advances in the treatment of disease of the liver. Vitamin K is not, however, always completely effective in controlling the haemorrhagic tendency in severe disease of the liver. Parenchymatous hepatic damage may be so severe as to prevent utilization of the vitamin in the manufacture of prothrombin, in which case even large amounts of vitamin K will be of no help in controlling the bleeding tendency.

Knowledge of the pathologic physiology of the liver was advanced by the increasing use of aspiration biopsy. Kaj Roholm and P. Iversen studied 26 cases of so-called catarrhal jaundice by this method. They found diffuse hepatitis, with destruction of the trabecular structure of the liver cells. C. J. Tripoli and D. E. Fader described a modification of a punch biopsy needle which permits the taking of specimens of hepatic tissue for biopsy without suction or maceration of tissues. There was considerable interest in this field, but the method did not receive gen-

eral acceptance, because it was associated with a definite risk which in some hands had approached that of laparotomy for the same purpose. It would seem that the procedure could be more valuable and could be more safely performed if it were combined with the more direct control which associated peritoneoscopy would afford.

The treatment of cirrhosis of the liver changed considerably during the decade. Treatment devoted principally to elimination of ascites by the use of mercurial diuretics, restriction of fluids and purgation was largely abandoned, and reliance was placed chiefly on a diet high in carbohydrate and protein, together with the administration of large doses of vitamin supplements. A. J. Patek, Jr. and Joseph Post said that this type of treatment was of value. In their series, the patients so treated survived for increased periods and exhibited signs of bodily improvement and presumptive evidence of arrest of the disease. Choline was suggested as an adjuvant in the treatment of cirrhosis. The value of choline was questioned by some, but it would appear to have some value in the hypertrophic phase of the disease, particularly where there has been considerable fatty replacement of the liver cells.

The question of the aetiologic agent in hepatocellular disease came into sharp focus because of the experience gained in World War II. The transmission of acute hepatitis by yellow-fever vaccine, in the preparation of which human serum was used, indicated that the use of whole blood and its products is attended by definite risk. The frequent occurrence of severe, often fatal hepatitis, among military personnel after the administration of human serum verified the transmissibility of the infective agent of hepatitis. It was believed that the causative agent is a virus, and there was evidence that the agent also may be transmitted via the human excreta and by droplet infection. The highly virulent course of the disease which follows the entrance of the infective agent by the intravenous route led to the labelling of hepatitis which follows the administration of whole blood or blood products as "homologous serum hepatitis" and to considering it as a separate entity, when compared with ordinary infectious hepatitis. Whether or not the condition actually is a separate disease, or whether the minor differences between homologous serum hepatitis and ordinary infectious hepatitis are the results of the difference in the portal of entry of the infective agent, had not yet been definitely established at the end of the decade.

M. W. Comfort and R. M. Hoyne called attention to an interesting entity which they chose to label "constitutional hepatic dysfunction." It is a condition of chronic jaundice in which no demonstrable impairment of hepatic function exists. The condition may be congenital or acquired, and probably is due to an inborn deficiency of the liver cells.

An adequate test for evaluation of the function of external secretion of the pancreas had long been awaited. Therefore, the development of a preparation of secretin, as reported by Gunnar Ågren, Henrik Lagerlöf and Hilding Berglund, which could be safely used, and which had a definite stimulating effect on the external secretion of the pancreas was highly significant. It is true that values for serum amylase and serum lipase had been of proved help in the estimation of pancreatic disease, but they are useful only during acute transient disease of the pancreas. No adequate measure of the function of the pancreas involved in a chronic disease process had been available heretofore.

In the field of treatment of pancreatic disease two trends

were apparent. The first was one of conservatism in the handling of inflammatory disease of the pancreas. The second was a willingness on the part of the surgeon to undertake radical resection of the pancreas for malignant disease and for chronic, long-standing, disabling, painful benign disease, such as extensive formation of stones.

Intestinal Tract.—The decade 1937-46 witnessed the development of a small-calibre double-lumened tube as a diagnostic and therapeutic aid in cases of obstructive lesions of the intestine. This tube found its greatest value in lesions involving the small intestine. T. G. Miller, W. O. Abbott and W. G. Karr demonstrated the ease with which the tube could be introduced and announced their willingness to perform intubation for patients with unexplained abdominal pain, abdominal distension, ulcerative colitis, obstruction of the common bile duct and intestinal obstruction arising from carcinoma of the cecum. Later, O. H. Wangensteen and his associates, R. J. Noer and C. G. Johnston and D. M. Willson reported experience attesting to the efficiency of the intubation method in handling acute intestinal obstruction. The tube was much favoured in the immediate postoperative period when surgical procedures have been performed on the intestine, since it not only acts as a safeguard in combating postoperative ileus, but also is of use for feeding purposes during the convalescent period.

Ross Golden emphasized the importance of diarrhoea as a symptom of disease involving the small bowel, and recommended roentgenologic examination of the small bowel in all cases of otherwise unexplained diarrhoea.

Numerous articles appeared emphasizing that Giardia lamblia, formerly considered a nonpathogen, is an important cause of morbidity, being not only a cause of protracted diarrhoea, but also an aetiologic factor in vague abdominal distress of various kinds. A simple, safe and effective means of eradication of the parasite became available in the form of atabrine.

Some of the most practically helpful advances observed in the care of intestinal disturbances centred about the development of new drugs. Prostigmine came to occupy an assured place in the effective control of abdominal distension. Papaverine was demonstrated to be of value in the control of painful intestinal spasm. Perhaps the most helpful aids in the care of intestinal disease came from the various sulfonamides. Sulfaguanidine, sulfasuxidine and sulfathalidine proved their worth as intestinal antiseptic agents, and came to occupy an assured place in the preoperative preparation of intestinal lesions and in the control of certain of the infectious diarrhoeas. The sulfonamides generally, and later the antibiotics, vastly improved the prognosis of such severe complications as perforation of acute appendicitis, or the rupture of any other abdominal viscus.

As was to be expected, World War II focused attention on diarrhoeal conditions, particularly those caused by the bacillary organisms. In this group of diseases the sulfonamides proved particularly useful.

J. S. Atwater and J. A. Bargen, studying a series of specimens obtained at necropsy, were able to trace the pathogenesis of intestinal polyps from the earliest epithelial change to frank carcinoma, emphasizing once again that the word "benign" should not be used in describing an intestinal polyp, but that the lesion should be considered, as it truly is, one stage in the pathogenesis of carcinoma, which eventually will definitely develop.

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All-American Canal

See Aqueducts; Canals and Inland Waterways.

Allen, Terry de la Mesa

Allen (1888—), U.S. army officer, was born April 1, 1888, at Ft. Douglas, Utah. After graduating from the U.S. military academy at West Point in 1911, he studied at the Catholic University of America, where he received his A.B. degree in 1912. He entered the U.S. army the same year, becoming a second lieutenant in the cavalry. He served with the A.E.F. in World War I, taking part in various U.S. offensives. Between the two World Wars he studied at several military institutions, including the Army War college. Allen, who was a brigadier general at the time of the Pearl Harbor attack, was made a major general in 1942. He assumed command of the 1st infantry division which participated in the Tunisian and Sicilian campaigns.

Ordered back to the United States in Sept. 1943, he was put in command of the 104th division. Returning to Europe, Allen led the 104th ("Timber Wolves") division in the fighting in the Netherlands in late 1944 in support of the right wing of the Canadian 1st army attacking

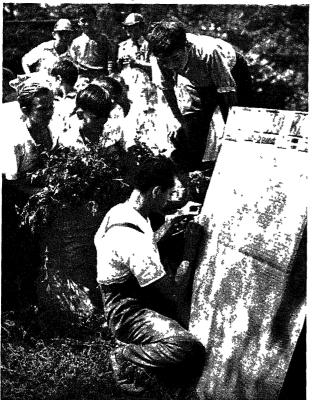
Antwerp. The 104th had fought its way into Germany at the end of the war. Gen. Allen returned to the U.S. in July 1945 and was slated for redeployment to the Pacific. After V-J day, however, he retired from the army (Nov. 21, 1945).

Allergy

Important questions regarding the mechanism of the allergic reaction were clarified during the ten years 1937–46. E. W. Phillips observed in 1939 that allergic persons required a period of three consecutive years of exposure to sugar-beet pollen before developing hay fever symptoms, and that five years of exposure to Johnson grass smut was required before allergy developed.

Chemical studies by A. Stull and his co-workers led to a differentiation of at least two antigens in ragweed pollen. Sensitive patients varied in their skin reactivity to each of the isolated fractions. Normal persons whose skin was temporarily sensitized with serum from ragweed patients likewise varied in their response to the two fractions. This indicated that serum from sensitive patients had different antibodies which corresponded to the isolated pollen fractions. By a different approach, R. Hecht and his coworkers, followed by M. M. Mosko and his associates, showed that the substances in ragweed pollen causing symptoms (allergens) could be differentiated on the basis of their molecular size. The portion consisting of small molecules was unaltered by boiling, and produced practically as strong skin reactions after heating as the whole untreated ragweed extract. This skin reactive portion was apparently only a partial antigen, as it was incapable of sensitizing rabbits. The second portion, consisting of the large molecular elements, was thermolabile and capable of producing immunologic reactions in the rabbit.

Ragweed harvesters at Cleveland, O., watching their competitive scoreboard. Aimed at relieving distress to hay fever victims in the area, the annual harvest ended with a party and honours for the highest scorers



Significant studies were made regarding antibodies in allergy. Stull and his co-workers showed that reagin, the skin sensitizing antibody, was associated with the globulin fraction of human serum. Most of the immunologic work in allergy dealt with the properties of a newly discovered antibody. This was first briefly noted by R. A. Cooke and his co-workers in 1935. The same author and coworkers established in later work that this new antibody "blocked" the reaction between serum used for sensitizing normal skin and the specific antigen. This "blocking antibody" was absent in untreated patients; it developed after pollen injections. M. H. Loveless and others in numerous contributions worked out the other important characteristics of this antibody. She found that in contradistinction to reagin, the new antibody resisted heating and could be produced in normal as well as allergic persons following pollen injections. Loveless later showed that the concentration of the blocking antibody in treated patients was generally proportional to the degree of their improvement. This relationship was questioned by the work of others, notably M. A. Scully and F. M. Rackemann. The report by F. W. Wittich of typical, spontaneous, seasonal hay fever in a dog gave workers an experimental approach in an animal which might ultimately help to resolve some of these contradictory reports.

Many new causes for allergic symptoms were described during the decade. Only the most important can be mentioned. The discovery of the prominence of air-borne moulds in respiratory and to some extent in skin allergy headed this group of contributions. The contributions of T. B. Bernstein and S. M. Feinberg, following the work of O. C. Durham and many others, emphasized that the status of moulds as causes of allergy was almost as important as that of ragweed pollen.

Emanations and bites from insects were found to be not uncommon as causes of allergy. Reports incriminated May flies, houseflies, mosquitoes, bees, wasps, moths and many other insects.

Simple chemicals as causes of allergy led to clarification of obscure and increasingly important allergic agents. Urticaria caused by aliphatic aldehydes (B. Z. Rappaport and M. M. Hoffman), hay fever and asthma resulting from chloramine T, and eczema from many contact substances were among the many causes described.

The scope of allergy was broadened by the discovery that certain conditions of obscure origin were occasionally caused by sensitivity. Thrombopenic purpura, a blood disturbance characterized by frequent internal haemorrhages caused by a deficiency of blood platelets, was shown by L. O. Dutton in 1938 to be due in some cases to food allergy. In 1937 T. L. Squier and F. W. Madison had reported other cases caused by drug allergy. S. F. Hampton reported one case of Henoch's purpura, another haemorrhagic condition, caused by food sensitivity. J. Harkavy concluded, from experiments on rats, that Buerger's disease, an illness in which small blood vessels become obliterated, was due to tobacco sensitivity.

An outstanding contribution toward the treatment of allergy was the development of the antihistamine compounds. By opposing the action of histamine, which is presumably an important cause of allergic symptoms, these newly developed drugs often relieved but did not cure. The compounds were first studied in France by A. M. Staub and D. Bovet. The drug they reported relieved anaphylaxis in animals but was too toxic for humans. Later, still in France, B. N. Halpern evolved much less

toxic compounds which could be used effectively in humans to relieve allergy. A number of antihistamine compounds were later used, including benadryl and pyrabenzamine.

Useful therapeutic contributions resulted from modification of pollen in various ways to slow its absorption. This was done either through chemical methods (G. E. Rockwell; H. L. Naterman) or by the addition of a substance like gelatin (W. C. Spain and associates). The use of gelatin or oil with epinephrin solution to slow its absorption was another effective contribution in the therapy of allergy.

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Allied Commission on Reparations

See REPARATIONS (WORLD WAR II).

Allied Control Commission for Austria

Early in June 1945, following the cessation of hostilities in Austria (q.v.), a joint British, French and U.S. reconnaissance party was sent into Vienna to survey and discuss the situation there with the soviet commander. On the basis of this party's report, the European Advisory commission in London reached agreement on the control machinery to be used by the four occupying powers—Great Britain, France, the U.S.S.R. and the United States. On July 6, 1945, command of the U.S. forces in Austria was assumed by Gen. Mark W. Clark, and late in August, the four powers established their respective headquarters in Vienna and Austria came under quadripartite control.

An Allied commission was organized as follows: (1) an Allied council, consisting of one high commissioner of each power; (2) an executive committee, consisting of a senior representative of each of the high commissioners; (3) staffs of each of the four powers, organized into divisions matching the main departments of the Austrian federal government; and (4) an Allied secretariat. Members of the commission might be either civilian or military, but the commanders in chief and their military deputies habitually filled the Allied council and executive committee posts. Provision was also made that political advisers of the respective high commissioners might attend the council meetings.

The Allied council, at its first meeting on Sept. 11, 1945, announced to the Austrian people that it had assumed supreme authority in Austria and that it would be guided by the Moscow declaration, in which the governments of the United Nations declared their intention to see restored a free, independent and democratic Austria.

In its deliberations, the Allied commission was obliged

to discuss all questions in at least four languages, to reconcile five different conceptions of "democracy" and to reach decisions by unanimous agreement. Despite these handicaps, considerable progress was made in many phases of reconstruction and rehabilitation. Complete severance of Austria from Germany in political and administrative matters was effected; the work of denazification and demilitarization was well organized, with satisfactory results attained; public transportation facilities were restored, in some cases to prewar levels; standards of housing, feeding, clothing, education and public health were materially raised; agriculture and industry were revived; and the currency was stabilized and inflation prevented.

On June 28, 1946, a new control agreement for Austria was signed and put into effect by the Four Powers. This agreement extended the authority of the Austrian government fully throughout Austria, subject only to certain reservations concerning matters in which the occupying powers had a particular and overriding interest, and to such special instructions as the Allied commission might give in other matters.

Adoption of this agreement was the most important step yet taken toward the restoration of a free and independent Austria and was hailed enthusiastically by the Austrian people.

For the first time, the Austrian government, which had come into being as a result of the democratic elections held in Nov. 1945, was free to function without the necessity of having all its actions approved by the occupying powers.

At the close of 1946, four major problems still confronted the Allied commission: (1) maintenance of an adequate food supply until the 1947 harvest, without benefit of further United Nations Relief and Rehabilitation administration aid; (2) disposition by repatriation or resettlement of some 230,000 displaced persons remaining in Austria; (3) establishment of freedom of navigation on the Danube; and (4) reaching of an agreement between the soviet, on the one hand, and the other three powers, on the other hand, with regard to the nature and extent of reparations to be demanded of Austria under the Potsdam agreement. The soviet unilateral definition of German external assets was a matter of grave concern both to the other powers and to the Austrian government, for the reason that complete implementation of reparations in accordance with this definition would prohibit the rehabilitation of the Austrian economy and set up a serious obstacle to the achievement of the economic unity of Austria.

(See also Allied Control Council for Germany; Allied Military Government; European Advisory Commission.) (M. Ck.)

Allied Control Council for Germany

The Allied Control authority, located in the city of Berlin, was organized by the four occupying powers in Germany for the period during which the basic requirements of unconditional surrender were to be carried out. It was established in conformity with the protocol "Agreement on the Control Machinery for Germany" as prepared by the European Advisory commission and ratified by the member governments of the United States, United Kingdom, France and the U.S.S.R. represented thereon. The highest echelon of the Allied Control authority was the Allied Control council, composed of the four commanders in chief of the four zones of occupation of Germany and established to ensure uniformity of action by the commanders in chief in their respective zones, to deal

with questions affecting Germany as a whole, and to control such German central administrative agencies as might be established. This body met three times monthly after July 31, 1945. Its chairmanship was held in rotation by each of its members in the order United States, United Kingdom, France and the U.S.S.R.

The co-ordinating committee, the next subordinate level of the control authority, was composed of a representative of each of the four commanders in chief, in general the deputy military governors. The functions of this committee, acting on behalf of the control council and through the control staff, included carrying out the decisions of the control council, co-ordinating current problems, preliminary examination of all questions submitted to the control council, and the day-to-day supervision and control of activities of such German central agencies as might be established. The co-ordinating committee met six times monthly after Aug. 11, 1945, with the same procedure for chairmanship as the control council.

The control staff, the third echelon of the control authority, was composed of 12 directorates and 1 commission, each being quadripartite.

The military directorate was concerned primarily with the disbanding of the German wehrmacht, its disarmament, disposition of arms, ammunition and equipment. The naval directorate functions were similar to those of the military directorate insofar as German naval matters were concerned. The air directorate acted on matters affecting the former luftwaffe and air traffic, military and civilian, in Germany.

The transport directorate dealt with all matters involving motor, rail and water transportation, including questions involving inland water transport and questions of international transport involving Germany.

The political directorate had a dual function of supervising the political activities within Germany and serving as the office of contact between the Allied Control authority and foreign nations. The economic directorate, the largest directorate, covered the whole broad field of matters pertaining to the economy of Germany, including the level of industry plan, price control and control of scientific research and development. The finance directorate was made responsible for the fiscal and price control policy of the Allies.

Other directorates included the following: reparations, deliveries and restitution directorate, performing the functions indicated in its title; internal affairs and communications directorate, concerned with civil administration, public safety, public health and welfare, and organization and operation of the communications system within the four zones, the latter including postal problems; legal directorate, with the responsibility of supervising the legal structure of Germany for the control authority; manpower directorate, concerned with matters affecting trade union organization, employment, unemployment compensation policy, work codes and general wage policy.

The prisoner of war and displaced persons directorate had responsibility for prisoners of war, limited generally to co-ordination of movement among the four zones of Germany of discharged prisoners of war. It advised the control council on matters affecting the return to their native countries of the numerous labourers brought to Germany to support the reich's war effort, and other displaced persons. It was concerned also with the migration into Germany of such minority groups as were expelled from other countries.

The German external property commission was formed after the original agreement. In it were vested, by control

council law, titles to German external assets.

For the administration of the greater Berlin area, garrisoned jointly by forces of the four occupying powers, the Allied Control authority established the Allied Kommandatura, composed of the four commanders in chief of the four national sectors of Berlin.

The Allied Control authority was serviced by the Allied secretariat and the administrative bureau. All discussions throughout all echelons of the control authority were conducted in the three official languages—English, French and Russian. For convenience, particularly in matters of legislation, German translations of documents were accepted but had no official status. (See also Allied Control Commission for Austria; Allied Military Government; European Advisory Commission.)

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Allied Control Organization for Japan

On Sept. 2, 1945, on the U.S.S. "Missouri" anchored in Tokyo bay, General of the Army Douglas MacArthur, the supreme commander for the Allied Powers, accepted the surrender of Japan for the United States, the Republic of China, the United Kingdom and the Union of Soviet Socialist Republics, and in the interests of the other United Nations at war with Japan. The instrument of surrender was also signed by representatives of the United States, the Republic of China, the United Kingdom, the Union of Soviet Socialist Republics, the commonwealth of Australia, the dominion of Canada, the provisional government of the French Republic, the kingdom of the Netherlands and the dominion of New Zealand.

The responsibility for achieving the ultimate objectives of the United Nations with respect to Japan—the fostering of conditions which would give the greatest possible assurance that Japan would not again become a menace to the peace and security of the world and which would permit it eventual admission as a responsible and peaceful member of the family of nations—lay with three authorities: the supreme commander for the Allied Powers, the Far Eastern commission, and the Allied Council for Japan.

On Aug. 14, 1945, the same day that Japan accepted the terms of the Potsdam declaration, General MacArthur was designated the supreme commander for the Allied Powers. On the grounds that Allied relations with Japan did not rest on a contractual basis, but on unconditional surrender, the authority of the emperor and the Japanese government to rule the state was subordinated to the authority of the supreme commander for the Allied Powers. He became the sole executive authority for the Allied Powers and exercised his authority through the Japanese governmental machinery and agencies to the extent that this arrangement satisfactorily furthered Allied objectives.

For his guidance, General MacArthur was sent by radio on Aug. 29 and, after approval by the president, by messenger on Sept. 6, 1945, a statement of U.S. government policy entitled "U.S. Initial Post-Surrender Policy for Japan," which was prepared jointly by a committee composed of representatives of the department of state, the war department and department of the navy and dealt with such subjects as military occupation, relationship of Allied authority to the Japanese government, disarmament and demobilization, war criminals, encouragement of desire for individual liberties and democratic processes, economic de-

militarization, resumption of peaceful economic activity, and also provided for the participation in the occupation of Japan of the forces of other nations that had taken a leading part in the war against Japan. In accordance with this provision, U.S. forces in Japan were joined by British commonwealth forces during the first three months of 1946.

As a means of co-ordinating the methods of consultation with other countries interested in the occupation of Japan, the U.S. government on Aug. 21, 1945, invited the governments of China, the United Kingdom and the soviet union to agree to the establishment of a Far Eastern Advisory commission to be composed of the four major Allies adhering to the Moscow declaration of Oct. 30, 1943, and other United Nations with territories in the far east. The terms of reference of the Far Eastern Advisory commission provided that it should be responsible for making recommendations to the participating governments on policy matters connected with the surrender of Japan and on the steps necessary and the machinery required to ensure the strict compliance by Japan with the provisions of the instrument of surrender. The United Kingdom, China, Australia, France, Canada, India, the Netherlands, New Zealand and the Philippines accepted the U.S. proposal to join the Far Eastern Advisory commission, but as the soviet union refused to join the work of the commission before a control council, closely resembling the control council for Germany, was established for Japan, it did not participate in the activities of the Far Eastern Advisory commission.

However, an agreement was reached at Moscow on Dec. 27, 1945, by the foreign ministers of the United States, Great Britain and the soviet union, with the concurrence of China, for the establishment of a Far Eastern commission, composed of the representatives of the soviet union, United Kingdom, United States, China, France, the Netherlands, Canada, Australia, New Zealand, India and the Philippine commonwealth. The Far Eastern commission was formed as a policy-making body with authority (1) "to formulate the policies, principles, and standards in conformity with which the fulfilment by Japan of its obligations under the terms of surrender may be accomplished"; (2) "to review, on the request of any member, any directive issued to the supreme commander for the Allied Powers or any action taken by the supreme commander involving policy decision within the jurisdiction of the commission"; and (3) "to consider such other matters as may be assigned to it by agreement among the participating governments...."

Under the terms of reference of the Far Eastern commission, the supreme commander was charged with the implementation of the directives prepared by the U.S. government expressing the policy decisions of the commission which were dispatched to him through the appropriate U.S. government agency. However, the U.S. government was permitted to issue interim directives to the supreme commander pending action by the commission whenever urgent matters arose not covered by policies already formulated by the commission, provided that any directives dealing with fundamental changes in the Japanese constitutional structure or in the regime of control, or dealing with a change in the Japanese government as a whole were issued only following consultation and following the attainment of agreement in the Far Eastern commission. The first meeting of the Far Eastern commission was held in Washington, D.C., on Feb. 26, 1946.

The three governments also agreed, with the concurrence of China, in the establishment in Tokyo of an Allied

Council for Japan to be composed of the supreme commander as chairman, a United States member, a Union of Soviet Socialist Republics member, a Chinese member and a member representing jointly the United Kingdom, Australia, New Zealand and India. The purpose of the council was to consult with and advise the supreme commander in regard to the implementation of the terms of surrender, the occupation and control of Japan.

Although the terms of reference of the Allied council provided that the supreme commander would consult and advise with the council in advance of the issuance of orders on matters of substance, circumstances permitting, he was the sole executive authority for the Allied Powers in Japan, and in all cases action was to be carried out under and through him. He was to issue all orders for the implementation of the terms of surrender, the occupation and control of Japan, and supplementary directives. If any disagreement arose in the council regarding the implementation of a policy decision of the Far Eastern commission upon any question dealing with fundamental changes in the Japanese constitutional structure or in the regime of control, or dealing with a change in the Japanese government as a whole, the supreme commander was to withhold action pending clarification of its decision by the Far Eastern commission. However, when necessary, the supreme commander, after appropriate consultation with the council, could change individual ministers or fill vacancies. The first meeting of the Allied council was held April 4, 1946, in Tokyo. (See also Allied Military Government; JAPAN.) (J. H. Hc)

Allied Military Government

As defined by the United States war department, civil affairs-military government encompassed all powers exercised by the military commander with respect to the civilian population in liberated, friendly or axis territory during World War II and the postwar period. "Military government" was that established and maintained by the military commander in occupied axis territory prior to its return to the independent authority of the indigenous government and the relinquishment of control by him, or in liberated or friendly territory where no government was recognized by treaty, agreement or course of action as having authority independent of the military commander. "Civil affairs" was the relationship entered into, and the responsibility assumed by a military commander with respect to the government and inhabitants of liberated or friendly territory in which an indigenous government was recognized by treaty, agreement or course of action as having authority independent of the military commander.

Among the powers and responsibilities which might be assumed by the military authorities were the preparation and issuance of proclamations and regulations for civilian populations; the establishment of military courts and the supervision of the indigenous system of justice and the trial and punishment of conventional war criminals (the trial and punishment of major war criminals was conducted in accordance with directives from higher authority); the supervision and control of the civilian economy, including planning for and procural of necessary military supplies to meet minimum civilian requirements; the care, control and repatriation of displaced persons and refugees; the reactivation and supervision of normal functions of civil government such as finance, industry and commerce, food and agriculture, education, labour, public safety, public health and welfare, prisons, religion, social organizations, public information (including the reorienta-



Allied military government officials supervised German civilians at Bruehl as they began to dig out the ruins left by Allied bombing raids in 1945

tion of axis thinking, press and radio, publications, films, theatres, music and instructional materials), transportation, communications, property control, archives, arts and monuments, censorship of civilian communications; salvage of materials for civilian use; and the control of restitution and reparations. (Restitution and reparations were handled in accordance with direction from higher authority—subsequent to combat phase of operations.) Hereafter in this article, the term "civil affairs" will be used, for the sake of brevity, to include both civil affairs and military government.

The inevitability of military responsibility for civil affairs was a proved fact. In its relatively short existence, the U.S. army had participated in 25 to 30 military occupations. In the Mexican, Civil and Spanish-American Wars, civil affairs was one of the major responsibilities of the military commanders. A large part of the success of the occupations of the Philippines and Cuba resulted from proper regard for and actions of military governors; Burgoyne's failure at Saratoga, and many of the failures of the Civil War could be traced to improper civil affairs actions.

Personnel and Training.-The Rhineland experience of World War I caused the U.S. army, in the '20s and '30s, to train and plan for civil affairs. Between World War I and World War II, civil affairs instruction was given at the War college; provision was made for civil affairs organizations and operations in the war plans of the general staff. By Dec. 7, 1941, the army had published a civil affairs manual which contained the principles learned and civil affairs operational policy evolved from past experiences. In addition, there was a small group of officers who were trained in this special field. Thereafter the army's School of Military Government was established at the University of Virginia, Charlottesville, Va., and the first class graduated in Sept. 1942. At one time during World War II, civil affairs training was given in army and navy schools located at 12 of the nation's leading universities. By the time hostilities had ceased, more than 7,000 officers had received this special training. Following cessation of hostilities the training program was curtailed; thereafter replacements only were trained. The 7,000 trained was the number estimated to be required during hostilities. On defeat of the axis and occupation of all areas, additional personnel requirements were to be met by transfers from other units of the army. As combat personnel needs decreased early in 1945, officers whose

civilian experience qualified them for government duty were transferred from combat units.

In the fall of 1945, there were approximately 30,000 U.S. military personnel engaged in civil affairs in occupied areas. Also, following defeat of the axis, the transition from all military personnel to a combination of civilian and military personnel began. To make the control of the axis areas more representative of the United States, plans to replace some of the military with civilian personnel as rapidly as security considerations permitted had been approved. In the summer of 1946, 15,000 U.S. nationals were engaged in civil affairs activities in occupied areas, of whom 8,000 were military and 7,000 civilian.

Civil Affairs Organization.—In the winter of 1942–43, while the North African operation was under way, national and international policy-making bodies were established in Washington to formulate U.S. and Allied civil affairs policy to be executed by military forces in friendly and enemy areas. The principal U.S. body operated under the joint chiefs of staff and the international body under the combined chiefs of staff. For the most part, this civil affairs policy had to do with political, economic and social questions, but during hostilities there were always military implications which were often of vital concern. The basic political, economic and social policy questions were co-ordinated with the departments primarily responsible for such matters in the United States and in the other Allied and associated powers. But because of the military

Parisian children eating at a communal restaurant set up by Allied relief authorities after the French capital's liberation in 1944



implications and because of the primary responsibility of the war and navy departments to support and provide policy guidance to commanders overseas, the joint and combined chiefs of staff controlled the machinery charged with the co-ordination of the civil affairs policy and its dispatch to commanders overseas. Lives of troops and success of military missions often depended on timeliness of policy direction. Success of the military mission was often influenced by exchange rates, supplies for civilians, treatment of displaced persons or availability of local materials. In this situation the military took the lead in supplying policy guidance to overseas commanders. Allied policy was formed at the military level, but only after consultation and guidance from the civilian agencies charged with primary responsibility in the foreign policy field.

In the year following cessation of hostilities, the diplomatic agents of the Allied governments assumed leadership in the operation of the machinery established to formulate foreign policy. Military implications became less and less a consideration; long-range political, social and economic objectives were substituted for those concerned with defeat of the enemy armed forces. As the war and navy departments' roles were restricted more and more to executive matters, the department of state became more active. A new committee made up of state, war and navy representatives assumed much of what had formerly been the work of the joint and combined chiefs of staff. In the spring of 1946, a new assistant secretaryship for occupied areas was established in the department of state.

With the cessation of hostilities, another policy-making class of agency, the Allied control bodies in occupied areas, came into very active operation. Prior to that time, central civil affairs missions and control bodies had operated, but it was not until the Allied control body was established in Germany, and later in Austria, that much of the policy making was shifted to the occupied areas. Restoration of free movement and communication between the capitals of the Allies and the occupied areas made this delegation desirable. Subordinate policy matters, which were tied closely to the task of execution, could better be discussed on the ground between those directly charged with execution. These national military commanders, who served both as commanders of their troops and as representatives of their nations on the control bodies, attempted to produce, vis-à-vis their military opposite numbers, a common occupation policy for execution of agreements of the heads of Allied governments or their diplomatic agents. These bodies were of extreme importance in Germany and Austria. For occupation purposes, each of those two countries was divided into four zones, and occupation responsibility for the two countries was assumed on a zonal basis by the four powers. The four-power Allied control bodies were to provide the central administration. When agreement was not possible, national policy was executed in the respective national zones of the occupied areas.

The organization and responsibility for Japan differed from the European pattern. Japan was not divided into zones, and control was united in the supreme commander for the Allied powers, who was also the U.S. commander. Instructions to him were issued through U.S. military channels. In addition, there sat in Tokyo a four-power council which advised the supreme commander; and in Washington an 11-power commission which formulated policies for the control of Japan. In situations where this commission had not formulated a policy, the United States, acting unilaterally, might issue interim directives.

Korea was occupied in the north by the U.S.S.R. and

in the south by the U.S. forces, each area being administered separately. Under the provisions of the agreement reached by the United States, United Kingdom, China and the U.S.S.R. in Moscow in Dec. 1945, a joint U.S. Soviet commission of military representatives of the two powers was formed in the spring of 1946, to co-ordinate military administration and, after consultation with the Korean democratic parties and social organizations, to assist in the formation of a representative provisional government for the whole of the country. This commission was not able to reach the detailed agreements necessary.

The civil affairs objectives of the United States were to control and accord to civilian populations treatment provided for under the rules of international law; to obtain resources and services in aid of the military mission; and, in a liberated area, to encourage the political rebirth of the nation so that it might become an active ally in the prosecution of the war, and, in an enemy area, to rid it of the immediate political and economic influences which had brought on the war. The broad mission was a mixture of diplomatic and executive responsibilities. Also, the political and economic objectives in enemy areas were long-term programs reaching beyond the hostilities phase of war. The diplomatic mission was a primary responsibility of the heads of the Allied governments and their diplomatic agents; the executive mission was a primary responsibility of the military which controlled the troops and supplies only through which the objectives could be

Areas of Allied Disagreement.—Prior to the outbreak of World War II, most civilized nations of the world had reached substantial agreement on the standards of treatment to be accorded civilian populations by military forces, the extent of governmental control to be exercised by military commanders and the permissible extent of exploitation of local resources and services by military forces. Treaties and conventions adhered to or binding on the United States had been codified in the U.S. army's Field Manual 27-10.

Determination of and (in the case of allies) agreement on political and economic objectives could never, because of their very nature, be made in advance of war and identification of allies and enemies. Long before cessation of hostilities in World War II, the Allies were in substantial agreement on the basic objectives. There was agreement among the Allies that the political and economic life of the axis nations should be controlled through complete occupation by military forces, and that this control should be gradually relaxed and finally removed only after these axis nations had demonstrated their right to become members of the community of democratic and peace-loving nations. Further, there was agreement to demilitarize the axis nations, to purge from government and business the nazis in Germany and the ultranationalists in Japan, to exact reasonable reparations, to punish war criminals and to democratize. Lack of agreement among the Allies pertained chiefly to matters of interpretation and translation of desires into effective action.

The Allies rapidly reached agreement to destroy the military machines of the axis nations and to demobilize the personnel. But demilitarization included destruction of the enemy war potential. Destruction of particular plants or groups of plants and the question of the level of production of a particular product demonstrated from the outset that while the Allies were united in their desire for defeat of the axis' armed forces, their interests in the axis' economy of the future differed radically.

In Germany, the most hated nazis, those personally responsible for the war and those who had held high positions of authority in government and business, had abandoned their positions of authority when the Allies arrived. But several hundred thousand persons who occupied positions of less authority, who felt they had a chance of survival and had remained, constituted problems requiring policy decisions. Agreements on categories to be removed were required. Here again, in the details of execution of policy, the Allies were not in complete agreement. The United States went much further than its Allies in disqualifying persons for office in government and business because of political affiliations or collaboration. In the U.S. zone of Germany persons labelled nazis could not be employed in government or business in any capacity higher than that of labourer.

Reparations was another of the objectives on which there was not complete agreement. All were agreed that axis nations should respond for the loss caused by the war insofar as it was feasible. It was not surprising, however, that the amount of feasible reparations should be disputed among Allies whose individual and personal interests in reparations varied between great extremes. Some of the Allies entered the war with a highly developed industrial plant and came out of the war with that plant not only undamaged but greatly expanded. Others had had an industrial plant largely undeveloped before the war, and during the war even that had suffered much damage. In this situation, regard for reparations varied from a positive desire not to accept axis goods and plants, except for research purposes, to a feeling of absolute dependence on axis goods and plants to restore war losses and to advance the development of home industry.

The variation in opinion pertaining to reparations was no greater than that pertaining to democratization. Each of the Allies desired to establish democratic governments in the axis nations, but they did not agree on a definition of democracy. To some, democracy meant free choice of government representatives by the majority of the electorate who would retain a right to establish and maintain opposing parties as agencies in the making of this choice; and following elections, the representatives would continue to be responsible to the people who would retain, under constitutional guarantees, the right to oppose these representatives in succeeding elections. To others, democracy had a quite different meaning. To them, it was government for the people but not by the people. Officials were responsible to the government and not to the people; no right to be in opposition or to have elections in the future was guaranteed by the constitution. As a guarantee of its future security, each of the Allies desired to establish in neighbouring areas governments with ideals and forms similar to its own.

One of the declared war aims of the Allies was the punishment of war criminals. This aim was proclaimed in the Moscow declaration, reaffirmed at Potsdam and internationally implemented by the London agreement of Aug. 8, 1945, and by a policy agreement of the Far Eastern commission which was formulated in the Articles of the International Military Tribunal for the Far East. President Roosevelt and congress made many statements expressing determination that the program for the prosecution of war criminals would be vigorous and unrelenting. There was precedent in U.S. history for such prosecution; Captain Wirz, commandant of Libby prison, Andersonville, Ga., was tried and hanged in 1865 for killing prisoners

without justification by the laws of war.

German zonal administration became the most vexing of all subjects of disagreement among the Allies. The Potsdam declaration provided for administration of Germany as a political and economic unit. Economically and administratively, the four zones of Germany were interdependent. The four zones were established to determine only troop occupation responsibility of the several Allies; insofar as these lines were used to establish administrative and economic barriers, they impeded attainment of almost all the basic objectives of the Allies. In the summer of 1946, the United States announced at Stuttgart its determination to provide for integration of the administration of Germany by the four powers insofar as possible, and invited all of its Allies to join with it. It appeared that only the British would join the United States in integrating the administration of the zones.

The diplomatic difficulties of the Allies in Germany were reflected in Austria and Korea. The same basic differences existed in Japan, but that country was not divided into zones. There, execution of policy was under the supreme commander of the Allied powers, and administration did not wait on diplomatic agreement among the Allies.

Mission of the U.S. Armed Forces.—In spite of the slow rate at which agreement among the Allies had been reached in negotiations between the heads of government or their diplomatic agents, much was accomplished by the military forces toward attainment of the principal objectives both during and after hostilities.

The first objective, accord of humane and fair treatment to civilian populations, was attained simultaneously with occupation of an area. Civilian conditions improved as order was restored and as shipping for civilian supplies became available. Attainment of the first objective made realization of the second possible. Restoration of order and provision of supplies brought to the military forces the local goods and services. The political objectives were not always as readily attained. However, even in this controversial field, rapid progress was made. Within a relatively short time after the invasion of North Africa, there was a government at least tentatively acceptable to those concerned. Before the next step was taken against the axis, French armed forces had taken the field, and local supplies and services were being furnished. The story was repeated throughout the advance toward Germany, whether through Allied, friendly, nonbelligerent, or other class of area. Before the Normandy and southern France operations were launched, the Italians were at work for the Allies and had divisions in combat and supply services in operation. Before the Siegfried line was penetrated, aid was being received from the metropolitan French, the Belgians, Dutch and Luxembourgers. In the Pacific, the situation was quite different. There, until Manila was reached, the areas occupied by U.S. army and navy forces were sparsely settled by natives devoted to minor agricultural pursuits, and the problems presented by large concentrations of peoples in industrial centres were not present. At most, the civil affairs operations there were no more than small-scale exchanges of goods for services, with minor relief and health operations. In some of these operations the U.S. forces were assisted by Australian and Dutch civil affairs personnel. U.S. forces did not engage in civil affairs in the Balkan countries. Its Balkan operations were limited to small forces for relief and rehabilitation in support of its Allies.

It was never necessary for the army or the navy to assume responsibility for the government of any of the liberated countries occupied. In western Europe, civil affairs agreements were made at the military level with the governments in exile concerned, in advance of occupation where possible. Under these agreements the governments concerned exercised authority and assumed responsibility for the government of their own countries. They pledged support to the Allied forces in their mission against the axis. While there was provision for assumption of complete control by Allied commanders if a government should break down, it was never necessary to exercise this power in any country. Entry on to the Italian mainland had been under an armistice agreement which provided for the return to an acceptable Italian government, the responsibility for the government of territory when occupied and when conditions warranted relaxation of military control. On cessation of hostilities in Europe and the far east in 1945, national governments existed in all liberated territories. Most of these areas which had been occupied and dominated for several years by the axis powers were then lending material aid to the Allied forces.

In the postwar period, the major civil affairs responsibility of the United States was in Germany, Austria, Italy, Japan and Korea. In Italy there were only two provinces under Allied control pending territorial settlements; Korea, controlled in the north by Russia and in the south by the United States, because of the long domination by the Japanese, was without political experience and a trained corps of government personnel to assume responsibility for its government; Austria, although divided into four zones for occupation purposes, was governed by a freely elected Austrian central government subject to control by the Allied high commissioners pending execution of a peace treaty. Germany was without a central government and was controlled by the four-power Allied Control council in Berlin when interallied agreement was possible, or on a national zonal basis when agreement was impossible. Japan was administered as a unit by the United States with the assistance and advice of its allies.

At the end of the year following cessation of hostilities, it was possible to measure factually the extent to which the primary objectives had been attained. Beginning with the liberation of axis-held areas, and the first occupation of axis territory, the Allied forces were confronted with a problem created by the axis' policy of conscripting labour in conquered countries and exploiting the resources of areas occupied by their armies. As a result of this policy, the Allies were faced with the repatriation of approximately 10,000,000 civilians and almost 10,000,000 military personnel. In the fall of 1946 the task of moving this huge mass of people was more than 90% completed. There were 6,000,000 displaced persons repatriated from Germany, of which 2,500,000 were from the U.S. zone. Some 350,000 remained in the U.S. zone, voluntary nonrepatriables who for political, economic and other reasons did not desire to return to their homes and who, under U.S. policy, were not forced to do so. Some 800,000 German civilians were expelled from the Sudetenland, Czechoslovakia and elsewhere in Europe and moved to Germany; 2,000,000 Japanese civilians from Korea, China and elsewhere in the far east; and 1,000,000 Koreans from Japan. The axis had, through varying degrees of coercion, imported millions of enforced labourers and had sent out millions of their own nationals to exploit occupied areas militarily and economically.

The civil affairs subject in occupied axis areas of most immediate interest within the United States was the

purging of nazis and Japanese ultranationalists both from government and positions of influence in commerce and industry. These were the people charged with guilt for the war; the party members, collaborators and other adherents; the jingoists, chauvinists and expansionists. In the U.S. zone of Germany, of 1,456,467 persons in government and business screened by the civil affairs organization, 373,762 were disqualified from holding any government or private position higher than that of labourer. In the summer of 1946, de-nazification in the U.S. zone was so far advanced, and responsible German government for the zone was so well established that further denazification was delegated to the Germans to act under supervision and direction of the military governor. In Japan, where a government was found intact and willing to carry out the orders of the supreme commander, purging of ultranationalists from the outset was made a responsibility of the Japanese acting under direction of the supreme commander. By Oct. 1946, 186,000 Japanese had been dismissed from government positions.

One year after cessation of hostilities, the military forces of the axis had been demobilized and the organization destroyed. Destruction of the economic war potential of the axis nations had progressed, but only to the limit of agreement among the Allies; reparations had progressed to a similar point.

In the same period, much progress was made in the establishment of representative and responsible governments. A free press and democratic educational systems were being encouraged, and substantial results had already been achieved. Freedom of religion had been established throughout the occupied areas. Prior to the final defeat of Japan, except in Korea, liberated nations had re-established governments, freed of the quislings and the puppets. Korea had been under Japanese rule for 35 years. In that period, the Japanese had pursued a policy which prevented training of Koreans in government unless they demonstrated affection for Japanese control and disaffection for an independent Korea. The basic U.S. policy was to sponsor political growth among the Koreans and to train Koreans to administer their own government. There were Koreans in every department of government to whom all possible responsibility was delegated. Political parties had been organized and their leaders were advising the U.S. commander. In the U.S. zone, a legislature was in the process of creation. After liberation of southern Korea, U.S. forces dismissed all of the 70,000 Japanese and disaffected Koreans in government office; all Japanese were dismissed from business and other private employment; and all Japanese were repatriated from southern Korea. In Japan, much progress was made in the democratization of the dictatorial government. Political parties were established; democratic national elections, in which women participated for the first time, were held; and the constitution, rewritten to include democratic principles, was considered in the legislature. A revived press, freed of traditional control, played an important role in informing the public of the issues and in constructive criticism of the draft constitution.

Italy was under control of its own elected government, subject to authority exercised for the security of Allied troops by the Allied commander in one small area. The Austrians had re-established a freely elected government which assumed responsibility for administration of the nation. In Germany, while Allied disagreements had prevented the creation of German central administrative agencies as provided for by the Potsdam declaration, political parties had been organized and were active. In the

U.S. zone, political development had gone much further than it had in the zones of its Allies. Until Sept. 1946, the U.S. zone was the only one where elections had been held and local government administered by freely chosen officials. Early in September, elections were held in the soviet zone. Governments of the three states in the U.S. zone were headed by German minister presidents, appointed by the U.S. commander. These three also sat as a council of three, responsible for the central administration of the U.S. zone.

Defeat of the axis, liberation and re-establishment of free governments in Allied and friendly nations, and control of axis areas required investments by the Allied Nations in civilian supplies. Occupation costs in axis areas were a responsibility of the axis, but repayment had to await production of goods. To Oct. 1946, realization of the major U.S. objectives had required importation by the U.S. army into liberated and occupied areas of 8.522,104 tons of food, clothing and other civilian supplies. Of this amount, 7,834,467 tons went to Europe, and 687,637 tons to the far east. After cessation of hostilities and re-establishment of law and order, the United States began to realize returns on its investments, and goods began to move from the axis areas to the United States.

The United States undertook to apprehend persons who could be identified with specific crimes against U.S. nationals. This program was initiated even before hostilities ceased, and resulted in the arrest of more than 10,000. The trial before military commissions proceeded in a methodical way both in Europe and the far east. As of Aug. 1, 1946, the U.S. forces had arrested 16,000 suspects or material witnesses in war crimes for trial before U.S. military courts; 504 such trials had been conducted by the U.S. army, resulting in 457 convictions and 47 acquittals.

The trial of the 49 major war criminals at Nuernberg and Tokyo by the International Military Tribunals received greater public attention than the many trials of those who committed offenses against U.S. nationals. Those trials were of persons alleged to have committed crimes "against the peace," which meant in effect, planning, preparation, initiation and waging of wars of aggression, and "crimes against humanity" which referred to murders, extermination, enslavement and deportation and other inhuman acts committed against civilian populations as well as violations of the laws of war. (See WAR CRIMES.)

By the end of 1946, civil affairs in axis areas was shifting from negative to positive action. The first year had been spent in ridding, purging and correcting. Before it was possible to undertake positive steps to aid in the development of democratic institutions in the political, economic and social life of these totalitarian nations, it was necessary to restore order and stability to the communities. In 1946, native governments were functioning, schools were reopened and consumer goods were produced. Plans were also being executed to assist the peoples of these nations in developing a democratic way of life by information from abroad and by participation at home. Through newspapers, books, radio and motion pictures these people were being acquainted with the differences between a free and a regimented society. Through elections, drafting of constitutions, revisions of educational systems, labour laws and civil service, these people were beginning to learn the responsibilities and privileges of democracy in action. They were being acquainted with the differences between government for the benefit of the "state" (the political group in power) and government

in which the welfare and interest of the individual citizen was paramount.

(See also Allied Control Commission for Austria; Allied Control Council for Germany; Allied Control Organization for Japan; Displaced Persons; European Advisory Commission; Reparations [World War II]; War Crimes.)

(O. P. E.)

Allocations and Allotments

See Business Review; Law; War and Defense Agencies; War Production.

Alloys

See Beryllium; Magnesium; Metallurgy; Molybdenum; Monazite; Nickel; War Production.

Almonds

See Nurs.

Alpha Particle

See Physics.

Alphonso XIII

King Alphonso XIII of Spain (1886–1941), was born May 17, 1886, in Madrid. In 1939 the Franco government decreed the restoration to Alphonso of property valued at about \$8,500,000, which had been confiscated by the Spanish republic in 1932. Two weeks before his death the former monarch issued a manifesto renouncing his rights to the Spanish throne (which he fled after the "bloodless revolution" of April 1931) in favour of his son, Don Juan, whom a monarchist faction hailed as the future Juan III. Alphonso died in Rome, Feb. 28, 1941. The Franco government granted permission for his burial in the royal pantheon of the Escorial near Madrid.

Aluminum

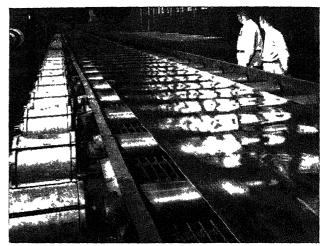
In addition to the major producers listed in Table I, there were minor outputs in Austria, Brazil, China, Hungary, India, Spain, Sweden and Yugoslavia. All except Brazil, China and India were producers in 1937, while the others were added after that year. Plans were underway in 1946 for the construction of a reduction plant in Australia.

Table I.—World Production of Aluminum

(Short tons)									
	1937	1938	1939	1940	1941	1942	1943	1944	1945
Canada	46,906	71,204	82,840	109,144	213.873	340,596	495.750	462,065	215,712
France	38,030	49,930	55,100	68,060	70.454	49,860	51,210	28,825	41,034
Germany	140,210	177,580	231,500	232,884	246,502	290,941	275.647	269,000	41,004
Great Britain	21,270	25,680	27,560	21,270	25,760	52,635	62,710	39.725	35.724
Italy	25,240	28,440	37,700	42,760	53,126	47,996	38.600	3	2
Japan	11,020	18,740	25,350	38,854	72,193	101,902	146,432	150.781	ż
Norway	25,401	32,006	34,315	30,622	19,321	22,595	25,920	22,085	ş
Switzerland	27,560	29,760	30,860	30,860	26,675	26,450	22,040	16,530	ģ
U.S.S.R	41,560	48,280	80,500	66,070	55,100	60,630	68,720	78,260	95,140
United States	146,341	143,441	163,545	206,280	309,067	521,106	920,179	776,446	496.487
Others	8,200	11,300	8,200	. 8,100	10,200	11,500	16,200	18,600	\$
Total	531,700	636,400	777,400	855,000	1,102,200	1,526,200	2,123,300	1,884,300	1,010,000

Table II.—Data of the Aluminum Industry in the United States

				(Short tons)					
	1937	1938	1939	1940	1941	1942	1943	1944	1945
Production, primary Imports, primary . Exports, primary . Producers' stocks . Available new supply Secondary recovery . Scrap imported	146,341 22,589 2,692 -1,742 167,980 62,560	143,441 8,870 6,309 +56,480 89,522 38,800 *	163,545 9,290 36,632 -31,443 167,646 53,947 5,046 476	206,280 17,435 26,886 -30,188 227,017 80,362 648 955	309,067 13,358 7,404 +12,232 302,789 106,857	521,106 112,112 38,747 +5,502 588,979 196,464 24 32	920,179 135,581 117,624 +60,787 877,349 313,961 241 14	776,446 100,969 188,108 -55,320 744,627 325,645 1,784 413	496,487 334,125 5,741 +28,790 796,081 298,387 5,168 802
Total supply * Included above under p	230,540 primary.	128,322	226,163	307,072	409,644		1,191,537	1,071,643	1,098,834



This aluminum rolling mill at Alcoa, Tenn., was the largest in the world when it went into operation months ahead of schedule in 1942. The photograph shows one sheet, as long as two city blocks, rolling off a continuous mill

As is indicated in Table I, war demand quadrupled output as compared with that of 1937, and almost tripled it as compared with 1939. The bulk of the increase between 1937 and 1939 was in axis countries, in active preparation for the coming struggle, while subsequent increases measured the Allied response. In this comparison the records of Canada and the United States were particularly outstanding. In both cases, output was expanded six times over that of 1939; the combined output was twothirds of the world total in 1943, against one-third in 1939. Although the output available to the axis countries had about doubled between 1939 and 1943, partly because of increases in their own capacity but more because of their control of occupied and satellite countries, this expansion was not sufficient to offset the enlarged Allied output, and the percentage of the world total under axis control declined slightly.

The salient statistics of the aluminum industry in the United States are shown in Table II.

In spite of a sixfold expansion of U.S. aluminum production during the war years, demand greatly exceeded output, requiring heavy imports, mostly from Canada. Recoveries of secondary metal were also greatly enlarged, but most of

this increase was in the reworking of new plant scrap, and only a relatively small amount of old scrap was brought back from the pool of metal in use. In this connection it may be noted that large amounts of scrap became available from the thousands of aeroplanes left over from the war; the handling of this surplus presented a major problem.

An important feature of the postwar disposal of U.S. government-owned plant capacity was the effort to strengthen the competitive position in the domestic aluminum industry. This action was in

From

accordance with the court decision of March 1945 which found that the Aluminum Company of America was a monopoly in some phases of its operations. To offset this situation it was provided that in the disposal of surplus government facilities, no sales would be made to Alcoa that would strengthen their monopolistic control; plants in this category could be sold only to competitors of Alcoa. Accordingly, sales or leases on a number of government plants were arranged with two competing companies.

BIBLIOGRAPHY.-N. H. Engle, Aluminum, an Industrial Marketing Appraisal (1944); D. R. Hobbs, Aluminum, its History, Metallurgy, and Uses (1938); U.S. Bureau of Mines, Minerals Yearbook. Periodical: Mineral Industry. (G. A. Ro.)

Ambassadors

The following is a list of ambassadors to and from the United States and to and from Great Britain from 1938 through Jan. 1, 1947.

		•				
To and From the United States						
	To	From				
Argentina .	Espil, Felipe A. (1938-43, absent 1944)	Weddell, Alexander W. (1938-39) Armour, Norman (1940-44) Braden, Spruille (April-Aug.				
	Escobar, Dr. Adrian C. (1945)	1945)				
	Ibarra, García Dr. Oscar (absent, 1946)	Messersmith, George (April 1946–47)				
Belgium	Ivanissevich, Don Oscar (1947) Straten-Ponthoz, Count Robert van der (1938–44) Silvercruys, Baron Robert (1945–47)	Gibson, Hugh S. (1938) Davies, Joseph E. (1939–40) Biddle, Anthony J. D., Jr. (1942–44)¹				
Bolivia	Guachalla, Dr. Luis F. (1943–44) ³ Andrade, Victor (1945–46) Martinez Vargas, Don Ricardo	Sawyer, Charles (1945) ² Kirk, Alan G. (1947) ² Boal, Pierre de L. (1943–44) Thurston, Walter (1945–46) Flack, Joseph (1947)				
Brazil	Aranha, Oswaldo (1938)	Caffery, Jefferson (1938-44) Berle, Adolph A., Jr. (1945-46) Pawley, William D. (1947)				
Canada	Brandão, Mario de P. (1939) Martins, Carlos (1940-47) McCarthy, Leighton (1944) ³ Pearson, Lester B. (1945-46) Wrong, Hume (1947)	Pawléy, William D. (1947) Atherton, Ray (1944–47)				
Chile	Trucco, Manuel (1938-39) Cabero, Alberto (1940-41) Michels, Rodolfo (1942-44) Mora, Marcial (1945-46) Nietro del Rio, Don Felix	Armour, Norman (1939) Bowers, Claude G. (1940-47)				
China	Wang, Chengting T. (1938) Hu Shih, Dr. (1939–42) Wei Tao-ming, Dr. (1943–46) Koo, Dr. V. K. Wellington (1947)	Johnson, Nelson T. (1938-41) Gauss, Clarence E. (1942-44) Hurley, Maj. Gen. Patrick J. (1945) Marshall, Gen. George C.				
Colombia	Pumarejo, Miguel L. (1939)* Turbay, Dr. Gabriel (1940–42) Vargas Nariño, Alberto (1943) Turbay, Dr. Gabriel (1944–45) Sanz de Santamaria. Carlos	(1946) Stuart, J. Leighton (1947) Braden, Spruille (1939–41, absent 1942) Lane, Arthur Bliss (1943–44) Wiley, John C. (1945–47)				
Costa Rica.	(1947) Escalante, Carlos M. (1944) ³ Gutierrez, Francisco de P. (1945–47)	Des Portes, Fay A. (1944) Johnson, Hallett (1945-47)				
Cuba	Martínez Fraga, Dr. Pedro (1938-41) Concheso, Dr. Aurelio F. (1942-44)	Wright, J. Butler (1938-39) Messersmith, George S. (1940-41)				
	(1942–44) Belt, Guillermo (1945–47)	Braden, Spruille (appointed, 1942) (1943–45) Norweb, R. Henry (1947) Biddle, Anthony J. D., Jr.				
Czechoslo- vakia	Hurban, Vladimír (1944–46) ³ Slavik, Dr. Juraj (May 1946)					
Dominican Republic .	Copello, Anselmo (1944) ³ García Godoy, Emilio (1945-46)	Steinhardt, Laurence A. (1945-47) Warren, Avra M. (1944) Briggs, Ellis O. (1945) McGurk, Joseph F. (1946) Butler, George H. (1947) *Long, Boaz W. (1939-43)				
Ecuador	Alfaro, Capt. Colón E. (1939–44) ³ Plaza, Galo (1945–47) Yllescas, Dr. Don Francisco (1947)	Scotten, Robert M. (1944–46)				
Egypt El Salvador.	Hassan Bey, Mahoud ³ (1947) Castro, Dr. Hector D. (1944) ³ *Castlo, Roberto (1945)	Tuck, S. Pinkney (1947) Thurston, Walter (1944) Simmons, John F. (1945–47)				
France	Saint-Quentin, Count de	Bullitt, William C. (1938–40) Leahy, William D. (1941–42) Caffery, Jefferson (1945–47)				
Germany	Henry-Haye, Gaston (1941-42) Bonnet, Henri (1945-47) Dieckhoff, Hans H. (1938-39, absent 1940-41)	Dodd, William E. (1938) Wilson, Hugh R. (1938–39)				

Great Britain	Lindsay, Sir Ronald (1938–39) Lothian, Marquess of (1940) Halifax, Viscount (appointed 1940) (1942–46) Kerr, Sir Archibald Clark (1946) Inverchapel, The Rt. Hon. the Lord (1947)	Bingham, R. W. (1938) Kennedy, Joseph P. (1938–41) Winant, John G. (1942–46) Harriman, W. Averill (1946) Gardner, O. Max (1947) (Died_before taking post)
Greece Guatemala .	Lord (1947) Diamantopoulos, Cimon P. (1943–46) ³ Economou-Gouras, Paul (1947) Recinos, Dr. Adrian (1944) ³ Silva Pena, Eugenio (1945)	Biddle, Anthony J. D., Jr. (1943) MacVeagh, Lincoln (1944–47) ⁵ Long, Boaz (1944–45) Kyle, Edwin Jackson (1946)
Haiti	Garcia Granados, Jorge (1947) Liautaud, André (1944-45) ³ Antoine, Jacques C. (1946) Charles, Joseph D. (1947)	White, John C. (1944) Wilson, Orme (1945–46) Tittmann, Harold H., Jr.
Honduras	Cáceres, Dr. Julián R. (1944–47) ³	(1947) Erwin, John D. (1944–47)
Iran	*Shayesteh, Mohammed (1945) ³ Ala, Hussein (1947)	Morris, Leland B. (1945) Murray, Wallace (1946) Allen, George V. (1947) Phillips, William (1938-41) Kirk, Alexander C. (1945-47)
Italy	Suvich, Fulvio de (1938-39) Colonna, Ascanio d.p. (1940-41)	Phillips, William (1938-41) Kirk, Alexander C. (1945-47) Dunn, James Clement
Japan	Tarchiani, Alberto (1947) Saito, Hirosi (1938) Horinouchi, Kensuke (1939–40) ⁶ Nomura, Kichisaburo	Grew, Joseph C. (1938-41)
Luxembourg	(appointed, 1941) *Le Gallais, Hugues (1945-47)3	Sawyer, Charles (1945)2
Mexico	Castillo, Nájera, Dr. Francisco (1938–45)	Daniela Josephys (1938–41)
	Espinosa de los Monteros, Dr.	Messersmith, George S. (appointed, 1942) (1943–46)
Netherlands.	Antonio (1946) Loudon, Dr. A. (1943–47) ³	Messersmith, George S. (appointed, 1942) (1943–46) Thurston, Walter (1947) Biddle, Anthony J. D., Jr. (1943–44)
Nicaragua .	Sevilla Sacasa, Guillermo (1944–47)³	Hornbeck, Stanley K. (1945-47) Stewart, James B. (1944-45) Warren, Fletcher (1947) Biddle Anthony I. D. Jr.
Norway	Munthe de Morganstierne, Wilhelm (1943–47) ³	(1943–44)
Panamá	Boyd, Dr. Augusto S.	Osborne, Lithgow (1945–46) Bay, Charles U. (1947) Dawson, William (1940–41)
	(absent, 1940) ⁸ *Ehrman, I. H. (1941)	Wilson, Edwin C. (1942–43) Warren, Avra (1945)
	Boyd, Dr. Augusto S. (absent, 1940) ³ *Ehrman, J. H. (1941) Jaén, Guardia, Ernesto (1942–43)	Bay, Charles U. (1947) Dawson, William (1940–41) Wilson, Edwin C. (1942–43) Warren, Avra (1945) Hines, Brig. Gen. Frank T. (1947)
Paraguay	Jiménez, E. A. (1944-45) Vallarino, Dr. J. J. (1947) Valázquez, Dr. Celso R. (1943-46) ³	Frost, Wesley (1943-44)
Peru	*Acasta, Dr. Don Cesar K.	Beaulac, Willard L. (1945-47) Steinbardt Laurence A
10.4.	Freyre'y Santander, Manuel de (1938–44) Beltrán, Pedro (1945)	Steinhardt, Laurence A. (1938–39) Norweb, R. Henry (1941–43) White, John Campbell (1945) Pawley, William D. (1946) Cooper, Prentice (1947) Biddle, Anthony J. D., Jr. (1938–44) Lane Arthur Bliss (1945–46)
	Fernández-Dávila, Dr. Humberto (1946) Prado, Don Jorge Potocki, Count Jerzy (1938–40) *Kwapiszewski, Michal (1941) Ciechanowski, Jan (1942–45) Lange, Oscar (1947) Bianchi, João A. de (1945–47)³	Pawley, William D. (1946)
Poland	Potocki, Count Jerzy (1938–40)	Biddle, Anthony J. D., Jr.
	Ciechanowski, Jan (1942–45)	Lane, minu Dass (1745 40)
Portugal	Bianchi, João A. de (1945–47) ³	Norweb, R. Henry (1945) Baruch, Herman B. (1947)
Spain	Ríos, Dr. Fernando de los (1938–39) Cárdenas, Juan F. de (1940–47)	Norweb, R. Henry (1945) Baruch, Herman B. (1947) Bowers, Claude G. (1938-39) Weddell, Alexander W. (1940-42)
		naves, Cariton J. n. (1943-44)
Turkey	Ertegun, Menmet M. (1938–44)	Armour, Norman (1945) *Bonsal, Philip W. MacMurray, John Van A.
	*Erol, Orhan H. (1945) Baydur, Hüseyin Ragip (1947)	(1938-41) Steinhardt, Laurence A. (1942-44)
		(1942-44) Wilson, Edwin C. (1947)
U.S.S.R	Troyanovsky, Alexander As (1938–39)	Davies, Joseph E. (1938) Steinhardt, Laurence A.
	Oumansky, Constantine A. (1940–41)	(1940-41, absent 1942) Standley, William H. (1943)
	Litvinow, Maxim (1942–43) Gromyko, Andrei A. (1944–46) Novikov, Nikolai V.	Wilson, Edwin C. (1947) Davies, Joseph E. (1938) Steinhardt, Laurence A. (1940-41, absent 1942) Standley, William H. (1943) Harriman, W. Averell (1944-46) Smith, Lt. Gen. Walter B. (1947)
Uruguay		(1947) Dawson, William (1942–46)
Venezuela .	Escalante, Dr. Diógenes	Dawson, William (1942-46) McGurk, Joseph F. Corrigan, Frank P. (1940-47)
Vumaelassia	(1940-46) ⁸ *Falcon-Briceno, Dr. Don M. A. Fotish, Constantin (1943-44) ⁸	Riddle Anthony I D In
Yugoslavia .	Fotitch, Constantin (1943-44) ³ *Franges, Ivan (1945) Simic, Stanoje (1946)	Biddle, Anthony J. D., Jr. (1943) MacVeagh Lincoln (1944)
	Kosanovic, Sava N.	MacVeagh, Lincoln (1944) Patterson, Richard C., Jr. (1945-47)
		/ ·- ·· /
*Not of amba	ssadorial rank.	

*Not of ambassadorial rank.

1. Accredited in 1942 to governments of Belgium, Czechoslovakia, Greece, the Netherlands, Norway, Poland and Yugoslavia, all established in England. Biddle resigned Jan. 22, 1944.

2. Accredited to governments of Belgium and Luxembourg.

3. Previous diplomatic representatives were below ambassadorial rank.

4. Made ambassador in 1942.

5. Accredited to governments of Greece and Yugoslavia.

6. Made ambassador during 1939.

To and From Great Britain

To and From Great Britain						
	_					
	To	From				
Argentina	Malbran, Dr. Manuel (1938) Le Breton, Dr. Tomás A. (1939-41)	Ovey, Sir Esmond (1938-42) Kelly, Sir D. V. (1943-46)				
	(1939-41) *Cárcano, Dr. Miguel Angel	Leeper, Sir Reginald W. A. (1947)				
	*Carcano, Dr. Miguel Angel (1942-46)1	(
Belgium	de Labougle, Dr. Ricardo de Marchienne, Baron E. de C.	Clive, Sir Robert H. (1938-39)				
	(1938-46) de Thieusies, Vicomte Alain O.	Oliphant, Sir Lancelot (1940-44)				
		Knatchbull-Hugessen, Sir H. M. (1945–47)				
Brazil	de Oliveira, Dr. Régis	Gurney, Sir Hugh (1938-39) Knox, Sir Geoffrey G.				
	(1938-40) de Aragâo, J. J. Moniz (1941-47)	(1940–41)				
	(1941-47)	Charles, Sir Noel N. H. (1942–44)				
Chile .	Edwards Augustin (1938)	Gainer, Sir D. St. C. (1945–47) Bentinck, Sir C. H. (1938–40)				
	Edwards, Augustin (1938) *Renard, Luis Adolfo (1939) Segoret, Octavio (1940–41)	Bentinck, Sir C. H. (1938–40) Orde, Sir Charles W (1941–45)				
~	Señoret, Octavio (1940-41) Bianchi, Manuel (1942-47)	"Lecne, J. H. (1947)				
China	Quo Tai-chi (1938-41) Koo, Dr. V. K. Wellington	Knatchbull-Hugessen, Sir H. M. (1938) Kerr, Sir Archibald Clark				
	(1942-46) Tien-Hsi, Dr. Cheng	(1938–42)				
		Seymour, Sir H. (1943-46) Stevenson, Sir Ralph C S.				
Colombia	Jaramillo Arango, Dr. Jaime (1947) ²	Snow, T. M. (1945–46) Broadmead, Philip M				
	Echandía, Dr. Don Darío (1946)	Diodalicus, 1 mip 11.				
Czechoslo-	Lobkowicz, Maximilian (1944-47) ²	*Nicholls, P. B. B. (1944-47)				
vakıa Egypt	Dr. Hafez Afifi Pasha (1938)	Lampson, Sir Miles (1938-43) Kıllearn, Lord (1944-46)				
	*Rostum Bey, Waguih (1945)	Kıllearn, Lord (1944–46) Campbell, Sır Ronald I				
	Abd el Fattah, Amr Pasha (1947)	•				
France	Corbin, Charles (1938-40) Massigli, René (1945-47)	Phipps, Sir Eric (1938–39) Campbell, Sir Ronald H.				
		(1940) Cooper, Alfred Duff (1945–47)				
Germany .	von Ribbentrop, Joachim	Henderson, Sir Nevile M.				
_	(1938) von Dirksen, Dr. Herbert (1939)	(1938–39)				
Greece `.	Aghnides, Thanassis (1944–47) ²	(1944–46)				
Iran	Seyed Hassan Taqizadeh	Norton, Sir Clifford Bullard, Sir R. W. (1945-46)				
_	(1945-47)2	Le Rougetel, Sir John H.				
Iraq	*Sayid Raouf Chadirji (1938-40)	Kerr, Sir Archibald Clark (1938)				
	*Sayid Ata Amin (1941–43) *Sayid Daud al Haidari	Peterson, Sir M. (1939) Newton, Sir B. C. (1940-41) Cornwallis, Sir K. (1942-45)				
	(1944-45) Wadi, Shakir El (1946)	Stonehewer-Bird, Sir F. H. W.				
Italy	Emir Zaid Grandi, Count Dino	(1947) The Earl of Perth (1938-39)				
•	Grandi, Count Dino (1938–39) Bastiánini, Giuseppe (1940)	Loraine, Sir P. L. (1940) *Charles, Sir Noel (1945-47)				
	Bastiánini, Giuseppe (1940) *Carandini, Count Nicolŏ (1945–47)					
Japan	Shigeru Yoshida (1938) Mamoru Shigemitsu (1939-41)	Craigie, Sir Robert L. (1938-41)				
Mexico	Diaz, Dr. Alfonso de Rosen-	Bateman, C. Harold				
	zweig (1945–46) ² O'Farrill, Frederico J.	(1945–47)				
Netherlands.	van Verduynen, Jonkheer E. Michiels (1944–47) ²	Bland, Sir G. N. M. (1944-47)				
Norway	Colban, E. A. (1944-46) ² Prebensen, Per Preben	Collier, Sir L. (1944-47)				
Peru	Benavides, Alfredo (1945) ²	Forbes, V. C. W. (1945)				
Poland	Raczyński, Count E.	Roberts, Walter St. C. H. Kennard, Sir H. W. (1938-41) Dormer, Sir Cecil (1942-43)				
	(1938-45) Strasburger, Henryk (1946)	Dormer, Sir Cecil (1942-43) O'Malley, Sir O. St. C. (1944-45)				
	Michalowski, Jerzy	(1944-45) Cavendish Bentinck, V. F. W.				
Portugal	Monteiro, Dr. Armindo	(1947)				
	Monteiro, Dr. Armindo (1938-43) The Duke of Palmella	Selby, Sir Walford H. M. (1938-40)				
Snain	(1944–47)	Campbell, Sir R. (1941-45) O'Malley, Sir O. St. C. (1947)				
Spain	Flórez, Pablo de Azcárate y (1938–39)	Chilton Sir H. G. (1938) *O'Malley, O. St. C. (1939) Peterson, Sir M. (1940)				
	The Duke of Alba (1940–45) de las Barcenas, Domingo	Hoare, Sir Samuel (1941–44)				
Turkey	(1947) Bay Ali Fethi Okyar (1938-39)	*Mallet, Sir V. (1947) Loraine, Sir P. (1938-39)				
	*Aras, Dr. Tewfik Rustu (1940-42)3	Knatchhull-Hugessen Sir				
	Orbay, Huseyin Rauf (1943-44)	H. M. (1940–44) Peterson, Sir M. (1945–46) Kelly, Sir David				
	*Unaydin, Rusen Esref (1945) Açikalin, Cevat (1947)					
U.S.S.R	Maisky, Ivan (1938–43) Gousey, Feodor Tarasovitch (1944–46)	Viscount Chilston (1938)				
	(1944-46)	Seeds, Sir W. (1939–40) Cripps, Sir Stafford (1941–42)				
	Zarubin, Georgi	Kerr, Clark, Sir Archibald (1943–46)				
		Peterson, Sir Maurice				

Lindsay, Sir Ronald (1938-39) The Marquess of Lothian (1940) Halifax, Viscount (1941-46) Kerr, Sir Archibald Clark (1946) Bingham, Robert W. (1938) Kennedy, Joseph P. (1939-41) Winant, John G. (1942-46) Harriman, W. Averill (1946) Gardner, O. Max U.S. Baron Inverchapel Vereker, G. G. M. (1945-47) MacEachen, Dr. Don Roberto (1945-47)² Posterra, José Rafael (1945)² Azpúrua, Andrés Rodriguez (1947) Jevtié, Bogoljub (1944-45)² Leontié, Ljubo (1947) Uruguay . . Ogilvie-Forbes, Sir G. A. D. Venezuela . (1945-47)

Stevenson, R. C. Skrine (1944-46) Yugoslavia . Peake, Charles B. P.

From

1. Made ambassadorial rank.
2. Previous diplometic according to the control of th

Previous diplomatic representatives were below ambassadorial rank.
 Made ambassador in 1941.

*Not of ambassadorial rank

Amblygonite

See LITHIUM MINERALS.

American Academy of Arts and Letters See Societies and Associations.

American Academy of Arts and Sciences

See Societies and Associations.

American Academy of Political and Social Science

See Societies and Associations.

American Association for the Advancement of Science

See Societies and Associations.

American Association of Law Libraries

See Societies and Associations.

American Bankers Association

See Societies and Associations.

American Bar Association See Societies and Associations.

Peterson, Sir Maurice

American Bible Society See Societies and Associations.

American Chemical Society See Societies and Associations.

American Citizens Abroad

After the close of World War I, U.S. citizens in everincreasing numbers journeyed abroad for business, pleasure, health cures, study and other varied reasons. The peak of this travel was reached in 1937, when 168,016 new passports were issued and the census showing the number of U.S. citizens already abroad totalled 390,437. For many years the value of U.S. citizens living abroad as well as the value of those travelling temporarily for business or pleassure had been recognized as a potent factor in international trade as truly as it was a factor in the maintenance of good will and understanding and in the pursuit of cultural activities. The dollars spent by U.S. citizens temporarily travelling abroad in the year 1937 was estimated to have been \$472,000,000, which constituted in the eyes of those studying commerce among the nations of the world a most important U.S. import. This sum of money represented the expenditures of 500,000 U.S. citizens for their maintenance, their pleasure and their travel. In 1939, with travel restricted by the passage of the Neutrality act to areas which could be reached without passing through

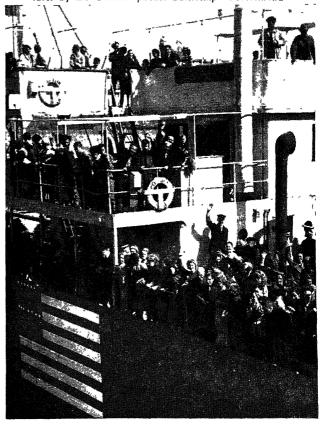
what were officially proclaimed as combat areas, the number of U.S. citizens abroad was materially decreased, both with respect to those in residence and with respect to the temporary travellers. The issue of U.S. passports had already dropped off by about 34,000 in 1938 as war seemed to draw nearer, and the census figures of those living abroad showed a comparable decrease for the year. A steady decline in the number of U.S. citizens travelling abroad and those maintaining residence outside the home country was apparent throughout the years 1939, 1940 and 1941. In an attempt to withdraw U.S. citizens from the highly troubled areas of the world, ever-increasing limitations and restrictions on travel were promulgated by the authorities in Washington, D.C. As the war clouds finally broke and the storm of World War II increased in scope and fury, those persons unnecessarily remaining outside their native land were urged to leave the troubled areas while there was time. The efforts of U.S. authorities were directed toward evacuation from Europe and the far east of those who could be persuaded to leave. At the same time, as the danger of the submarine warfare increased, only such travel from the United States as was considered imperative was permitted. It was considered imperative, according to the traditions of the United States, to permit the travel, even through combat seas, of nurses, ambulance drivers, relief workers and others on errands of mercy and assistance. Business and family travel was judged by the same standards of necessity and help. The shortage of return transportation to the United States was overcome for a time by government chartering of certain merchant ships to care for its stranded citizens. Publication of the opportunities to proceed homeward was general throughout the world, and U.S. diplomatic and consular officers urged citizens not to delay their departure and endanger their safety even though it involved sacrifice of material things. Nevertheless, when in Dec. 1941 the tragedy of Pearl Harbor plunged the United States into the war, thousands of U.S. citizens were caught in the areas of actual combat. With every ton of shipping put in use for war-essential travel, many of these people still remained outside the United States, awaiting transportation homeward. The known and registered U.S. citizens were speedily joined by others with technical claims to citizenship which would never have been asserted had not safety of life demanded the exertion of every effort toward escape from the lands overrun by the conqueror. With the departure from axis territory of U.S. diplomatic and consular officers, the chance of departure of private citizens disappeared. The welfare and protection of U.S. citizens still within the axis' power was entrusted to the Swiss diplomatic and consular representatives. It was estimated that toward the close of the year 1946, some 59,940 still awaited repatriation, some being fully documented and others awaiting their turn for processing to start the homeward journey. The rough estimates on this subject showed the following approximations:

Albania	200	Germany	7,000
Austria	1,000	Hungary	36o
Bulgaria	50	Italy	12,000
Czechoslovakia	800	Japan	5,000
British Isles	500	Poland	20,000
Finland	്ദര	Rumania	450
France	50	U.S.S.R.	2,000
Greece	7,000	Yugoslavia	3,500
	-	-	50.040

Simultaneously with the program looking to the return of U.S. citizens abroad, the presidential proclamation of Nov. 14, 1941, was issued requiring every citizen of the

United States, including seamen who should enter or depart from the United States, to possess a valid passport. The presidential proclamation was followed by the regulations of the secretary of state dated Nov. 26, 1941, which provided exemptions for members of the armed forces, the Red Cross and civilian employees of the war and navy departments. All other U.S. citizens were obliged to carry valid passports and their entry into and departure from the United States was checked by officers of the government services especially instructed for this work. This control enabled the government to expedite travel of those on war work all over the world, conserving transportation for urgent requirements arising constantly in remote or nearby areas. Arrangements were made with foreign countries through whose territory uniformed men were obliged to pass to expedite this transit on purely military documentation, omitting passports and customary visas. Neutral countries such as Portugal and Eire could not facilitate travel of uniformed men but expedited other official travel in all possible ways. Thus, the normal peacetime work of promoting the travel of U.S. citizens to destinations abroad and engaging in negotiations looking to relaxation of onerous travel requirements became a security work of preventing anything in the way of travel not essential to the prosecution of the war and at the same time expediting the travel of the hundreds of thousands of civilians employed to carry on essential war work, from the building of quonset huts to the completion of harbour works, the building and maintenance of air bases, the transportation of all lend-lease and war supplies carried by the merchant marine. The territory covered in these activities ranged

American and Canadian survivors of the torpedoed "Athenia" arrived Sept. 13, 1939, at Halifax aboard the U.S. freighter "City of Flint," which was captured as a contraband carrier a month later by the German pocket battleship "Deutschland"





Scene aboard the U.S. liner "Manhattan" Sept. 7, 1939—as returning U.S. citizens hastened to leave war zones

from Iceland to Ascension Island in the Atlantic, Africa, the middle east, China, the Pacific islands, Australia and New Zealand, as well as into most of the countries of the Americas. U.S. civilians on duty service travelled constantly and extensively all during the hazardous days of the war. U.S. merchant seamen delivered their cargoes despite the fury of submarine and air warfare, neither hardship nor casualties interfering with the progress of the work. The issue of passports during the war years was predicated not only upon customary proof of U.S. citizenship and travel essential to the war effort, but upon the satisfactory security check carried out by the agencies of the government authorized to do such work.

During 1939 and 1940, the Flying Tigers, American Field service, American hospital in Britain, American Legion Ambulance corps, American Volunteer Ambulance corps and many other organizations lent their aid in addition to the American Red Cross, the Friends Service committee and others long engaged in humanitarian work.

On April 10, 1941, the well-known red U.S. passport was replaced throughout the world by a new passport completely different in colour and content. The bearers of red passports were required, if living abroad, to appear personally before the nearest U.S. consul and, after being fingerprinted and otherwise properly identified, were issued the new passports for the unexpired validity of the old one. In this way the government was able to make useless hundreds of U.S. passports which had been acquired by certain foreign governments for illegal use by agents and spies, and at the same time have an opportunity to make personal contact with bona fide U.S. citizens and document them with more security. Those persons who returned to the United States after Sept. 1939 had their passports lifted at the port of entry and deposited with the government for replacement by the new type passport provided the bearer was authorized again to proceed abroad.

The breakdown of all normal financial transactions made life exceedingly difficult for U.S. citizens abroad after the United States entered the war, and the government endeavoured through the good offices of the Swiss representatives to make available to destitute citizens an allow-

ance sufficient to feed and care for them, along the very simple standards possible in most places. As the war progressed, however, most U.S. citizens were confined in concentration camps, only to be liberated in a rather small number of cases through exchange of civilians, or in the great majority of cases by the successful progress of the Allied troops. There were many U.S. citizens of dual nationality known only to the authorities by their foreign nationality. These in large numbers concealed their U.S. citizenship and were able to assist the Allies through their co-operation or to aid the axis, according to the strength of loyalty to the United States of the individual citizen. Some few were charged with treason; more were charged with collaboration with the axis, but most were loyal and rode out the axis control as best they could.

On Nov. 20, 1943, the president directed the joint chiefs of staff, in consultation with the department of state, to specify areas of active military operations into or through which civilians, other than those under the control of the joint chiefs of staff, agents of the department of state or persons whose travel was authorized by the president, might not go without specific approval of the joint chiefs of staff. This specific approval was directed to be sought by the chief of the passport division, acting for the secretary of state, in connection with the issue of passports. This same official was authorized to act for the secretary of state in consultation with the joint chiefs of staff in determining the areas to be designated primary military areas. In Nov. 1943, when the primary military areas were first established, all Allied and occupied countries were included in this restricted area. There was a gradual freeing of areas until at the end of 1946, only Austria, Germany, Korea and the main islands of Japan, Nansei Shoto and Nanpo Shoto remained as primary military areas.

At the close of 1946, U.S. citizens again could travel freely in the western hemisphere without U.S. passports unless the foreign country required the traveller to present one. Areas not requiring either passports or visas from U.S. citizens temporarily visiting them included the Bahamas, Bermuda, Canada, Canal Zone, Costa Rica, Cuba, Dominican Republic, El Salvador, Guatemala, Honduras, Jamaica, Mexico, Newfoundland, Panamá and Venezuela. These countries required in most cases that the visit be not more than 30 days, some granting 60 days and others up to 6 months.

For the rest of the world, travellers were requested to confine trips to those countries where their presence was required by compelling reasons. U.S. citizens travelling unnecessarily to areas of the world struggling to recover from the effects of the war were kept to a minimum in order not to add to the extremely critical food and housing conditions prevailing. Travel to Bulgaria, Rumania and Hungary continued greatly restricted by the Allied Control commission, and the granting of permission to enter those countries was still limited to persons conducting business of national importance. Requests for permission of the Allied Control commission to enter Bulgaria, Rumania and Hungary had to be made through the passport division, department of state. Travel to certain areas of China continued difficult and restricted, and U.S. citizens were cautioned to communicate with the nearest U.S. consular officer upon arrival in China before proceeding to the interior of that country or to north China.

The decade 1937–46 closed with the strongly expressed hope from most of the countries of Europe that transportation, food and housing conditions would soon be sufficient to warrant the resumption of the much-needed U.S. plcasure travel.

Statistics concerning U.S. citizens residing abroad as of Jan. 1, 1946, follow in so far as they were available at the end of the decade.

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Country	Head	Dependents	Total
Argentina	1,707	1,471	3,178
Australia	1,441	542	1,983
Bolivia	450	461	911
Brazil	3,748	2,336	6,084
Canada	72,076	93,277	165,353
Chile	908	718	1,626
Colombia	1,596	1,666	3,262
Costa Rica	649	147	1,096
Cuba	2,653	2,371	5,024
Dominican Republic	2,319	1,091	6,410
Ecuador	461	300	$\bar{7}61$
Egypt	564	215	779
El Salvador	225	150	375
Ethiopia	182	27	209
Greece	::•	• • •	7,384
Guatemala	669	755	1,424
<u>Haiti</u>	341	234	575
Honduras	444	441	888
India	•••	•••	4,600
Iran	39 8	71	469
Iraq	106	32	138
Lebanon	673	555	1,228
Liberia	357	125	482
Mexico	17,428	9,092	26,520
Morocco	. 130	46	176
New Zealand	172	543	715
Nicaragua	299	160	459
Palestine	2,786	2,114	4,900
Panamá	3,900	4,500	8,400
Paraguay	150	100	250
Peru	1,124	1,336	2,460
Philippine Islands	2,021	1,941	3,962
Siam			163
Syria	139	158	297
Turkey	273	83	356
Union of South Africa	950	749	1,699
Uruguay	250	200	450
Venezuela	1,805	1,479	3,284

268,330 (R. B. S.)

American College of Life Underwriters

See Societies and Associations.

American College of Surgeons

See Societies and Associations.

American Council on Education

See EDUCATION.

American Dental Association

See DENTISTRY; SOCIETIES AND ASSOCIATIONS.

American Economic Association

See Societies and Associations.

American Ethnology, Bureau of

See SMITHSONIAN INSTITUTION.

American Federation of Labor

See LABOUR UNIONS; SOCIETIES AND ASSOCIATIONS; STRIKES AND LOCK-OUTS.

American Geographical Society

See Societies and Associations.

American Historical Association

See Societies and Associations.

American Indians

See Indians, American.

American Institute for Property and Liability Underwriters.

See Societies and Associations.

American Institute of Accountants

See Societies and Associations.

American Institute of Architects

See Societies and Associations.

American Institute of Chemical Engineers

See Societies and Associations.

American Institute of Electrical Engineers

See Societies and Associations.

American Institute of Mining and Metallurgical Engineers

See Societies and Associations.

American Iron and Steel Institute

See Societies and Associations.

American Judicature Society

See Societies and Associations.

American Law Institute

See Societies and Associations.

American Legion

See Societies and Associations.

American Library Association

See Societies and Associations.

American Literature

Although many intelligent critics and reviewers viewed the approximately 100,000 titles of the decade 1937-46 with more dismay than pleasure, there were enough good books among this multitude to justify a belief that American literature was continuing to mature. At least 1,000 of the 100,000 deserved readers for years to come; perhaps 100 of them would live longer than the 20th century.

Not many of the books that deserved a more or less prolonged life were big best sellers, however. At the beginning of the decade, Margaret Mitchell's competent romanticization of southern history, Gone With the Wind (1936) and Dale Carnegie's blue book to success, How to Win Friends and Influence People (1938) were shattering all sales records. At the decade's close, Betty MacDonald's The Egg and I (1945), a lightly told story of life on a wilderness chicken ranch, and Taylor Caldwell's This Side of Innocence (1946), another period piece, outsold many more expert works in fiction and nonfiction. In the years between, cleverly concocted mixtures of unexacting religiosity, rosily viewed history, and near-pornography usually led the best seller lists. The cynical claimed that even such serious books as Native Son (1940), For Whom the Bell Tolls (1940) and The Grapes of Wrath (1939), all of which were both popular and critical successes, sold well because of their frank treatment of sex rather than because of the penetrating interpretation of life they presented.

It was undoubtedly true that most serious older and

younger writers found sufficient readers to earn them publication, if not a luxurious livelihood. Despite the emergence of publishing as a big business and an increasing tendency to retail books with as assured a popular appeal as a name-brand soap, the decade was rich in excellent books. Such writers as Hemingway in fiction, the Beards in history, Frost in poetry, Matthew Josephson in biography and Van Wyck Brooks in criticism wrote and published with little or no diminution in their previously established reputations for quality. Exciting and excellent new talents such as the poet Karl Shapiro, Arthur M. Schlesinger Jr., the historian, and the critic John Crowe Ransom continued to emerge and get the praise of both readers and critics.

The general level of competence was high indeed. Most authors wrote in a vivid, colloquial style that was unpretentious but accurate. Most books moved rapidly without too great a sacrifice of whatever depth the authors were able to penetrate. This was true of even the mystery stories that began to circulate more widely than ever before in the various pocket book series that started during the decade, and of the many I-was-there books by reporters that flooded the war and postwar book market.

Dashiell Hammett, Raymond Chandler, Craig Rice and others wrote almost as well, though not as meaningfully, as Hemingway, while John Hersey, Vincent Sheean and a number of other reporters seemed to have mastered the art of writing rapidly and perceptively at the same time.

The Novel

But most of the decade's best-selling novelists preferred to ignore the deepening shadow of war. There was war and trouble in a good many of the novels with big sales, but it was war and trouble safely embalmed in the past. Margaret Mitchell's Gone With the Wind (1936), Laura Krey's And Tell of Time (1938) and a host of slightly less popular novels such as Elizabeth Pickett Chevallier's Drivin' Woman (1942) continued to quarry the seemingly inexhaustible vein of Civil War and reconstruction days material. The American Revolution was almost as popular. In addition to many lesser novels, there was Kenneth Roberts' Oliver Wiswell (1940), a competent fictionalization of the revolution from a Tory point of view, and Howard Fast's Citizen Tom Paine (1943), one of the best accounts that had yet appeared of the difficult time American "liberal" leaders had in unifying the common man and beating the British.

Roberts and Fast were the only best-selling novelists of the decade who repeated their popular successes. Roberts' exciting account of Major Robert Rogers and the Northwest Passage (1937) had reached as many readers as Oliver Wiswell. Both of his novels were unusually authentic in detail and unusually faithful to historical documents, although liberal critics questioned his unsympathetic treatment of such American notables as Samuel Adams and Benjamin Franklin. It was with the conservative critics. on the other hand, that Fast had his trouble, for most of them disapproved what they regarded as his left-wing interpretation of the American past. His first novel, The Last Frontier (1941), a sympathetic portrayal of the Indian underdog, sold too few copies for the good novel it was, but his later books were big sellers. The Unvanquished (1942), called the best novel about Washington, and Citizen Tom Paine were outstanding among modern historical novels for their speed of movement and their thorough absorption of the detail of the past. His Freedom Road (1944), a moving portrayal of the difficulties of the intelligent Negro in the 19th century, and The American (1946), a novel about the troubled life of Gov. John Peter Altgeld of Illinois, were almost as good fiction though less reliable history. The work of both Roberts and Fast proved that historical fiction could do without the romantic distortion and the overemphasis of sex that had almost become the trade-mark of the genre.

Though the novels of Fast, Roberts and a few others pleased the critical who thought that literature should illuminate life, most best-selling fiction did not. The great majority of best sellers evaded rather than presented the grimmer realities. In this respect, both Kathleen Winsor's Forever Amber (1944) and Lloyd Douglas's The Robe (1942) were at one, since both of them managed to invest their respective historical periods with an aura for which sober historians could see little excuse. Much the same comment was deserved by Betty Smith's A Tree Grows in Brooklyn (1943), which, though it started out as authentically as a Farrell novel, faded into an Alger girl story in the last 200 pages about its slum-born heroine. More authentic and more illuminating, yet all this side of profound, were Christopher Morley's story of a working girl, Kitty Foyle (1939); Marjorie Kinnan Rawlings' tale of the life of a boy in the Florida back-country, The Yearling (1938); J. P. Marquand's account of the troubled life of a New Englander caught between the values of the old New England and the new New York world, H. M. Pulham, Esq. (1941); and Lillian Smith's fictional analysis of the racial tensions that led to a lynching in a small southern town, Strange Fruit (1944). All of these novels were well above average in competence, honesty and insight, but none of them penetrated the problems they presented with sufficient profundity to make one feel they would long outlast the decade in which they were printed.

Decline and Rise of Dreiser's Generation.—Of the novelists who established reputations before or during World War I, only three-James Branch Cabell, Booth Tarkington and Upton Sinclair-continued to publish in any quantity. A novel, The Buccaneers (1938), and a volume of short stories, Ghosts (1937), were published after Edith Wharton's death in 1937, but neither of them seemed equal to The House of Mirth (1906) or The Age of Innocence (1920). Theodore Dreiser's first novel in 20 years, the posthumously published The Bulwark (1946), made most discerning readers regret the long silence that preceded his death in 1945. It was shorter and better integrated than the books that made his reputation, and yet nearly as powerful as An American Tragedy (1925). Specifically, The Bulwark dealt with the conflict between two generations in a Quaker family, but it could almost stand as a fable of the plight of the religious man in a civilization increasingly dedicated to material values. Dreiser's near contemporary, Sherwood Anderson, who died in 1941, published no novels during the decade, but his Memoirs (1942) was likely to outlast all of his novels and all but a few of his short stories. It was one of the most honest and humble of autobiographies and deserved to rank with The Autobiography of Lincoln Steffens (1931) and The Education of Henry Adams (1907).

Two other writers of Dreiser's generation published sparingly but well. Willa Cather's Sapphira and the Slave Girl (1940), a delicate account of sexual rivalry between a slave and her mistress in pre-Civil War days, was not as ambitious in substance as her earlier novels, but it was as skilfully done as all but her best books. Ellen Glasgow, who had never been especially popular with either the

public or the critics, won both praise and readers with In This Our Life (1941), the Pulitzer prize winner for the year, while her book about her writing, A Certain Measure (1943), earned her a higher reputation among serious critics than she had ever had before. In This Our Life, the last novel she completed before her death in 1945, was an illuminating fictional exploration of the complex conflicts between two generations in a declining southern family, but it went beyond these specific conflicts to a dramatic analysis of many fundamental moral, social and economic problems of the time.

The three novelists in this older group who wrote the most neither received nor deserved much critical acclaim. Booth Tarkington continued to publish such novels as Rumbin Galleries (1937) and The Heritage of Hatcher Ide (1940), but he wrote nothing that approached the quality of his serious Alice Adams (1921) or his delightfully light Peniod (1914) and Seventeen (1917) before his death in 1946. In similar fashion, James Branch Cabell, although he continued to write deft novels such as Smire (1937) and First Gentleman of America (1942), failed to equal the witty sophistication of The Cream of the Jest (1917) and Jurgen (1919). Never as popular with the critics as either Cabell or Tarkington, Upton Sinclair continued his dauntless way with a book or two each year of the decade. The most notable of these were the Lanny Budd series, extending from World's End (1940) to A World to Win (1946). These novels could be praised justly for their liberal and exhaustive interpretation of contemporary history, but they were full of stilted incident and pasteboard characters. Nevertheless, most critics were happy to see Sinclair win the Pulitzer prize in 1942 with one of the Lanny Budd series, Dragon's Teeth. They felt it was a deserved tribute to the integrity of a man who had selflessly allied himself with almost every unpopular and "good" cause of the

Post-World War I Novelists.-Of the novelists who achieved distinction with books published shortly after World War I, Ernest Hemingway and William Faulkner increased their reputations, while John Dos Passos, who was once regarded as their peer, declined in critical esteem with the printing of Adventures of a Young Man (1939) and Number One (1943). Part of this decline may have been the consequence of Dos Passos's increasing tendency to desert the novel for reportage. Although his Journey Between Wars (1938), a collection of his best travel pieces from the preceding 20 years, State of the Nation (1944), an account of what people were doing, thinking and feeling in wartime America, and Tour of Duty (1946), a report on Europe after the war, were vividly done, they naturally took him away from the novel. So did his excellent study of the basic democratic ideas and their originators, The Ground We Stand On (1941). At any rate, Dos Passos' novels were generally regarded as inferior to the trilogy, US.A., which was published as a whole in 1938. Adventures of a Young Man, though vivid as a picture of American radicalism, seemed hurried and one-sided in its portrait of loyalist Spain. Number One was more satisfactory as a whole, an illuminating portrayal of a Huey Long-like politician, but it too was inferior to Dos Passos's best work in fiction.

Although he published only three books during the decade, Ernest Hemingway emerged from the period with an almost universal reputation as North America's leading novelist. Nevertheless, most critics felt that *To Have and Have Not* (1937), a too rapidly moving and too poorly integrated account of the misfortunes of Harry Morgan, was Hemingway's poorest novel. When For Whom the Bell

Tolls appeared in 1940, it became evident, however, that To Have and Have Not, with its imperfect statement of the author's growing concern for society as a whole, had been a necessary step in the writer's growth. The more discerning, indeed, had already recognized this when they read his play about the Spanish civil war, The Fifth Column, and his magnificent short story, "The Snows of Kilimanjaro" in The Fifth Column and the First Forty-Nine Stories (1938).

For Whom the Bell Tolls, Hemingway's novel of the Spanish civil war, was unquestionably one of the great novels of modern times. Unless it was Leo Tolstoy's War and Peace, there was no novel that compressed with similar eloquence the complex totality of individual sensations, emotions and ideas that modern war brings to consciousness. Hemingway's novel, with its theme that whatever happens anywhere affects everybody everywhere else, was substantiated by the history of the decade. Robert Jordan—confused, yet taking a stand amid the perplexities of a right side not totally right and a wrong side not totally wrong—stood as a symbol of the sensitive man in any war. No other American writer had produced a novel that so securely stood comparison with the better European novels of the period.

Always a voluminous, uneven and brilliant writer, William Faulkner gradually gained a reputation as one of the foremost American writers of fiction. His exploration of the social and emotional history of the south as embodied in the mythical chronicle of Yoknapatawhpha county included three of the better novels-The Unvanquished (1938), The Wild Palms (1939) and The Hamlet (1940)and one of the better collections of short stories (Go Down Moses and Other Stories, 1942) of the decade. His canonization as one of the better writers of the time was completed with the publication of *The Portable Faulkner*, brilliantly edited and introduced by Malcolm Cowley in 1946. Here was a connected story of Yoknapatawhpha county's development from 1820 on that was certainly a parable of southern man, and to some extent a parable of man as a whole, everywhere.

Most of the other novelists of Hemingway's generation published sparingly. Elizabeth Madox Roberts, whose Time of Man (1926) was one of the best books ever written by an American about poverty, turned increasingly to the exploration of the sensitive and thwarted consciousness in Black Is My True Love's Hair (1938) and Not by Strange Gods (1941). Her posthumously published Song in the Meadow (1940) contained some compressed and impressive poems that revealed a good deal about both herself and her native Kentucky. Even more sparing in his publications was Glenway Wescott, whose excellent short novel, The Pilgrim Hawk (1940), a subtle and profound exploration of jealousy, found fewer readers than his vivid but intemperate Apartment in Athens (1945), which fitted the emotional temper of most war-torn readers with its violent fictional attack on the German character. Both Wescott and F. Scott Fitzgerald, who died in 1940 and left the incomplete The Last Tycoon (1941) and the stories, essays and notebooks that were gathered together in The Crack-Up (1945) behind him, rose in critical estimation. Fitzgerald's unfinished novel promised to become one of the few intelligent and comprehending novels written about the film industry, while short pieces such as "The Crack-Up" and the notebooks showed that Fitzgerald might have written even better than he did in The Great Gatsby (1925) if he had lived longer.









Above, left to right: Authors of U.S. best sellers in nonfiction during 1937-46: Oscar Levant (A Smattering of Ignorance), Ernie Pyle (Here is Your War; Brave Men), Margaret Halsey (With Malice Toward Some), Wendell Willkie (One World), Richard Wright (Black Boy)

Three more prolific writers did not fare as well with the critics as their more frugal contemporaries. Despite the fact that it was a penetrating treatment of a woman's search for a social and individual faith, Waldo Frank's The Bridegroom Cometh (1938) was usually regarded as inferior to his City Block (1922) and The Death and Birth of David Markand (1936). His other novels, such as Summer Never Ends (1941), were largely ignored by the critics, although he was deservedly praised for the criticism he made of the American spirit in A Chart for Rough Water (1940), his frequently profound collected essays, In the American Jungle (1937), and his excellent report on Latin America, South American Journey (1943). Sinclair Lewis published more and fared even worse. It was the nearly unanimous opinion of the more discerning reviewers that Lewis's ill-tempered castigation of radical children in his Prodigal Parents (1938), his over-burlesqued portrait of a publicist in Gideon Planish (1943) and his study of divorce in Cass Timberlane (1945) were inferior to the fine social satire of Main Street (1920) and Babbitt (1922), while his light novel of a stage-crazy girl, Bethel Merriday (1940), was ignored by the critics but bought widely by the public. In such novels as The Rains Came (1938) and Mrs. Parkington (1943), slick and shallow treatments of subjects that were certain to attract readers if not critical praise, Louis Bromfield, whose The Green Bay Tree (1924) had promised well, descended into the growing group of novelists whose sensitivity to public reaction enabled them to sell well and to be forgotten rapidly.

Of the other novelists who made reputations in the early 1920s, Ruth Suckow and Thornton Wilder wrote no novels (though Wilder had two highly successful and competent plays, Our Town [1938] and The Skin of Our Teeth [1942] to his credit); Robert Nathan continued to publish slight but effective novels such as Winter in April (1937); Evelyn Scott repeated her turgid but honest attacks on conventionality in such books as Bread and a Sword (1937); and James Gould Cozzens scored a critical and popular success in his exploration of what goes on in the minds of judges and lawyers, The Just and the Unjust (1942).

Depression Novelists.—Most of the novelists who had made reputations in the early years of the depression continued to explore the social irony of poverty in a land of plenty until war absorbed their attention. Of these writers, John Steinbeck was easily the one who most nearly combined popular appeal with unpopular seriousness. His first best-selling novel, Of Mice and Men (1937), a compressed and compassionate story of homeless men, was fol-

lowed by the still more widely sold The Grapes of Wrath (1939), which was acclaimed by many critics as an Uncle Tom's Cabin of the impoverished. Both of these novels deserved to rank with such excellent proletarian novels of the early 1930s as Jack Conroy's The Disinherited (1933) and Robert Cantwell's The Land of Plenty (1934).

Steinbeck's later novels continued to sell well, but they were generally considered inferior by critics. The Moon Is Down (1942) was as economically told as Of Mice and Men and the very good short stories in The Long Valley (1938), but its sentimental portrayal of both the conquerors and the conquered in an invaded Norwegian town made it seem "untrue" as a dramatic analysis of war. Cannery Row (1944), a goodhearted fiction about bums and prostitutes in Monterey, Calif., had neither the compression nor the authenticity of the similar Tortilla Flat (1935). Perhaps the best books Steinbeck did during the war were his collaboration with Herbert Kline, The Forgotten Village (1941), about a small Mexican town, and his collaboration with Edward R. Ricketts, Sea of Cortez (1941), a study in biology that revealed a good deal about both the marine specimens and the philosophy of the novelist.

Erskine Caldwell followed a pattern similar to Steinbeck's. Before World War II broke out, Caldwell had written Trouble in July (1940), one of the best lynching novels to come from the south, and collected his always deit, sometimes moving, short stories about the socially and economically underprivileged into Jackpot (1940). During the war years he spread his genuine talent too thinly through too many books. His novel about the soviet invasion, All Night Long (1942), and his tale of a decadent southern family, A House in the Uplands (1946), were inferior to his earlier novels, while his later books of reportage did not have the force of You Have Seen Their Faces (1937), a photographs-with-text-report on the deep south he did in collaboration with Margaret Bourke-White.

The most steadily producing social novelist of the decade was James T. Farrell, who had made his reputation with Studs Lonigan (1937). An uneven but gifted writer, Farrell's principal work was the completion of a series of books about Danny O'Neill, who came from the same background as Lonigan but made more of a success of his life. In all of these novels (A World I Never Made, 1936; No Star Is Lost, 1938; Father and Son, 1940; My Days of Anger 1943), there was occasional eloquence and a constantly impressive piling-up of detail about his characters and their background. In Bernard Clare (1946), Farrell appeared to be starting another series of novels with his version of the artist as a young man in North America. Many critics wished that he would write less and less cumbersomely and believed he was at his best in such critical studies as The League of Frightened Philistines (1945) and The Fate of Writing in America (1946).

Two other writers of integrity and talent who published too much to sustain the reputations they earned in the early 1930s were Pearl Buck and Vardis Fisher. Fisher's fiction included the typically titled, Forgive Us Our Virtues (1938), his popular novel about the Mormons, Children of God (1939), and a series of three novels about precivilized men and women. The third, Intimations of Eve (1946), was more highly praised than any of its predecessors; this group of books, called The Testament of Man, gave some promise of becoming as important as the earlier tetrology, In Tragic Life (1932), which had the defects of prolixity and the virtues of deep honesty that had always characterized Fisher's writing.

Although Pearl Buck—because of her excellent portrait of a Chinese family, The Good Earth (1931)—probably deserved the Nobel prize for literature as much as any recipient of the honour, her later novels, particularly Other Gods (1940) and Pavilion of Women (1946), did not maintain the quality of her earlier and better work. The Patriot (1939) and Dragon Seed (1942), both books about China at war, were nevertheless fine novels. As she revealed in her nonfiction books, Of Men and Women (1941) and American Unity and Asia (1942) she remained an artful propagandist for a world in which all men could be brothers. No amount of hurried artistry could totally obscure the fundamentally important moral message that impelled all her books.

Frederic Prokosch, like Pearl Buck, was concerned with the total international picture rather than with any specifically American subject. A novelist with an unusual knowledge of many countries and many people, Prokosch gave perhaps a better picture of the disillusioned intelligentsia of the day than any other U.S. novelist. Almost all nationalities appeared in his cast of characters, while Asia, Europe and New York served with equal effectiveness as his backgrounds. His earlier novels-The Seven. Who Fled (1937), Night of the Poor (1939) and The Conspirators (1943)-were better than his Idols of the Cave (1946), a sometimes vivid, too frequently diffuse, portrait of European refugee society in New York. Prokosch also showed himself to be a gifted poet, particularly in Death at Sea@(1940), in which he appeared to be outgrowing his overfascination with the style of W. H. Auden.

Three novelists who had first become notable during the early 1930s and who wrote little but well, continued to increase in stature. Josephine Herbst's Rope of Gold (1939) was perhaps the best of her left-wing fictional analyses of the middle class and a much more ambitious novel

Below, left to right: Authors of U.S. best sellers during 1937-46:
Margaret Mitchell (Gone With the Wind), William Saroyan
(Human Comedy), Betty Smith (A Tree Grows in Brooklyn), John
Steinbeck (Of Mice and Men; Grapes of Wrath; The Moon is
Down), Gladys Schmitt (David the King)

than her slight, deft, Satan's Sergeants (1941). Albert-Halper's The Chute (1937), although more diffuse than his earlier proletarian novel, The Foundry (1934), was a measured social criticism of the mailorder industry, while Sons of the Fathers (1940), a sympathetic treatment of first generation immigrants who became storekeepers, and Only an Inch From Glory (1943), a book about the little men of the middle class, extended his range of subject matter and showed an increasing mastery of a more economical style. Despite the fact that she was largely neglected by the public that had read Now in November (1934) avidly, Josephine Johnson continued to develop her great talent for saying much in short books. Her Jordanstown (1937), a spare parable of the conflict between labour and capital, and Wildwood (1946), a taut novel about an adolescent's search for affection, put her in the forefront of those writers of fiction who preferred suggestion to inundation in detail.

The most considerable novelist of the depression generation, Thomas Wolfe, was beginning to write more economically in his still too long You Can't Go Home Again, which was published the year after his death in 1939. In it, he renamed his chief character Monk Webber and retraced Eugene Gant's progress through the period covered in Of Time and the River (1935)-in other words, he rewrote the latter half of his slightly fictionalized autobiography. With the possible exception of Look Homeward, Angel (1929), it was his best novel, an eloquent book that was as full of a multiplicity of things, people and ideas as Whitman's poetry. It was about himself, his country, America's relation to Europe, the start of fascism, American literature and criticism, eating, sex and death, all magnificently communicated by a man who had perhaps the most sensitive sensory equipment of anyone who had ever written in the U.S. His earlier The Web and the Rock (1939) and the posthumously published The Hills Beyond (1941) were inferior fiction and did not add to the reputation his other books justly earned.

Another southerner who did not go home again was William March; his poorest novel, Company K, had enjoyed some popularity in 1933. Rarely a popular writer, March's psychological and social exploration of the south in such novels as The Tallons (1936) and The Looking Glass (1943), in short stories as those collected in Trial Balance (1945), was more artfully integrated than that of either Wolfe or Faulkner, although his scope was more restricted than Faulkner's and his gusto for experience was smaller than Wolfe's. Another neglected novelist of talent was Oliver La Farge. His too little read The Enemy Gods (1937) was quite as good as his Pulitzer prize winning Laughing Boy (1929), while his auto-











biography, Raw Material (1945), indicated that he was aware of the defects of his earlier fiction and might do still better work in the future. His brother, Christopher La Farge, who had usually been ranked as a popular fiction writer, turned out one of the best novels of 1946, The Sudden Guest, a complex and compelling psychological study of an egocentric woman that was also a fable of the insensitiveness of the comfortable American classes. All three of these novelists did better work than the more popular John O'Hara. The latter's swiftly moving mordant Appointment in Samarra (1934) had promised much more than the slick cynicism of such novels as Hope of Heaven (1938) and Pal Joey (1940) fulfilled.

New Novelists of the Decade.—Many promising novelists began what might become distinguished careers between 1937 and 1946. From close perspective, Robert Penn Warren, the southern poet, critic and novelist, seemed to have the greatest stature, but he was closely followed by Richard Wright, Gladys Schmitt, Charles Jackson and other novelists of indubitable talent.

Robert Penn Warren first attracted critical attention with his rapidly paced book about the tobacco wars in Kentucky, Night Rider (1939). At Heaven's Gate (1943), which centred upon the contrast between plutocracy and poverty in a large southern city, and All the King's Men (1946), an illuminating social novel about the life, death and influence of a Huey-Long-like politician, confirmed the judgment of his earlier critics. Selected Poems (1944) showed him to be one of the more gifted of the younger U.S. poets as well.

Richard Wright's *Uncle Tom's Children* (1938), a group of five novelettes about interracial conflicts in the south, did not attract the attention it merited, but *Native Son* (1940), the story of Bigger Thomas' socially fated fall, became a big best seller. *Black Boy* (1945), which told of Wright's experiences while he lived in the south, cemented the author's popular and critical reputation. Certainly one of the better North American novelists by any standard, Wright was clearly the most disciplined and gifted Negro craftsman in fiction, although Zora Neale Hurston and Arna Bontemps, of an earlier generation, approached his level in some of their books. The first novels of Chester Himes (*If He Hollers, Let Him Go*, 1945) and Ann Petry (*The Street*, 1946) also manifested a talent and a craft that closely approached Wright's.

Gladys Schmitt, Charles Jackson and Walter Van Tilburg Clark, all three of whom were praised for their first novels, disappointed some intelligent critics with their second books. The Lost Week-End (1944), a brilliant fictional study of drunkenness, was better received by both public and critics than Jackson's tale of the development of latent homosexuality in a middle-aged man in The Fall of Valor (1946). Gladys Schmitt's David the King (1946) seemed to many less impressive as a recreation of biblical history than her Gates of Aulis (1942) had been as a revelation of one of the major problems of the time-the conflicting importance of individual and social morality. The City of Trembling Leaves (1945) was acknowledged to be a more ambitious essay in fiction than Clark's The Ox-Bow Incident (1945), a philosophic novel about frontier justice, but the sprawling form of the second half of the later novel alienated many reviewers. It was generally agreed, however, that Clark, Miss Schmitt and Jackson-even at their not-bad worst-were promising fiction writers.

A number of other women writers seemed nearly as promising as Miss Schmitt to capable judges. Dorothy

Baker, whose Young Man With a Hoin (1938) had been called the best novel about a swing musician yet written and whose Trio (1943) was surely one of the most delicate treatments of homosexuality that an American had written, deserved more attention than she received. So did Carson McCullers with her excellent novel about a 13 year old girl who felt she did not "belong" to her family, The Member of the Wedding (1946). This was a tauter, better told novel than her earlier, more successful The Heart Is a Lonely Hunter (1940) and Reflections in a Golden Eye (1941). Helen Howe's sympathetically severe satire of intellectuals in The Whole Heart (1943) and We Happy Few (1946) deserved the acclaim it got from public and critics. Marjorie Kinnan Rawlings' expert short stories of the Florida country in When the Whippoorwill (1940) seemed to be underrated, while her novel The Yearling (1938) was perhaps overpraised. Christine Weston, after writing a number of inferior novels, won critical and popular success with her excellent novel about modern India, Indigo (1944), but her best-selling The Dark Wood (1946) seemed inferior to the more severe reviewers. Any one of these women might become as good novelists as Willa Cather or Edith Wharton.

Of the others who wrote a good many novels during the late 1930s and early 1940s, Conrad Richter, Meyer Levin, J. P. Marquand and Hamilton Basso all looked as though they might become important figures in modern American fiction. J. P. Marquand was most secure with the reading public, least secure with the critics. His The Late George Apley (1937) was undoubtedly a vivid and perceptive treatment of the conflict between the older and younger generations in modern New England, but such later books as Wickford Point (1939), H. M. Pulham, Esq. (1941) and B. F.'s Daughter (1946) seemed to many to be slight variations upon the theme of his first serious povel

Although he was only occasionally popular, Conrad Richter became during the decade the most highly praised American historical novelist apart from Howard Fast and Kenneth Roberts. His novels of frontier life-The Sea of Grass (1937), The Trees (1940) and The Fields (1946) were economically conceived and authentically based upon unromanticized history. Meyer Levin, in The Old Bunch (1937) and Citizens (1940), wrote perceptively of Jewish life in Chicago, Ill., and of the impact of left-wing movements on sensitive Chicago intellectuals. Although his scope was not as great as that of Farrell and his mastery of his medium was not as thorough as that of Nelson Algren (whose Never Come Morning [1942] was perhaps the most exciting and poetic novel that had come out of Chicago about the underprivileged) he promised exceedingly well. So did Hamilton Basso, who, however, seemed to be abandoning the novel for criticism in such books as Mainstream (1943), an account of seminal American ideas. In any event, his novel about New Orleans in Mardi Gras time, Days Before Lent (1939), one of the few modern novels that combined fast action with good thinking, and Sun in Capricorn (1942), one of the better modern novels about political demagoguery, deserved to rank with all but the best fiction of the time.

Of the first novelists of the decade 1937-46, there were a number whose later work might or might not confirm the high promise of their few but excellent first published works: Paul Goodman (The Facts of Life, 1945; The State of Nature, 1946); Mary McCarthy (The Company She Keeps, 1942); Jean Stafford (Boston Adventure, 1944); Elizabeth Hardwick (Ghostly Lover, 1945); Marguerite Young (Angel in the Forest, 1945); Jo Sinclair (Waste-

land, 1946); Bucklin Moon (The Darker Brother, 1948); Albert Maltz (The Underground Stream, 1940; The Cross and the Arrow, 1944); Saul Bellow (The Dangling Man, 1944); Frederick Wakeman (Shore Leave, 1944; The Hucksters, 1946); Mary Jane Ward (The Wax Apple, 1938; The Snake Pit, 1946).

Short Fiction.—Many of the novelists, like Ernest Hemingway and William Faulkner, were also superlatively good short-story writers. There were others during the decade, however, who confined their writing altogether to the short story or to the novella, or did their most successful work in this field. One of this latter group was Kay Boyle, who had earlier distinguished herself as a novelist with such books as Year Before Last (1932) and Gentlemen, I Address You Privately (1933). Her later novels, most of them about France, declined into propaganda, a genre she was ill-fitted to write. Her best work of the decade was in the group of long stories about maladjusted young people, The Crazy Hunter and Other Stories (1940) and in her collection, Thirty Stories (1946).

The irrepressible William Saroyan, who rivalled Upton Sinclair in both the quantity of his work and in his inability to criticize himself, did his best with the short story. There were good short tales about the melancholy-happy, adolescent-adult people in whom Saroyan specialized in all of his numerous collections, but the best of them were probably to be found in Little Children (1937) and Love, Here Is My Hat (1938). His plays and his mawkishly sentimental novels, The Human Comedy (1943) and The Adventures of Wesley Jackson (1946), were overpraised by softhearted critics and sold well, but they were not up to the sometimes excellent short stories or to the collection of sketches about childhood that were grouped loosely together in My Name Is Aram (1940).

Eudora Welty wrote two novels, The Robber Bridegroom (1942) and Delta Wedding (1946), but neither merited the praise which her two collections of short stories about Mississippi life, A Curtain of Green (1941) and The Wide Net (1943), deserved and received. These firmly wrought stories were securely set in a region, but Miss Welty's Negroes, salesmen and old maids were sufficiently universal to interest people who cared nothing about Mississippi. Caroline Gordon also wrote two novels -None Shall Look Back (1937) and Green Centuries (1941)—that did not have the quality of her superlatively good short stories, collected in The Forest of the South (1945). In these short tales her south became a symbol of a slower, more graceful, more hedonistic way of life than that common to the north, but Miss Gordon constantly avoided sentimental nostalgia by making readers aware that her region was tragically surrounded and enveloped by a more vital and crass "civilization."

One of the best of short-story writers, Dorothy Parker, wrote almost nothing during the decade, but the few stories about the Spanish civil war she added to Here Lies. The Collected Short Stories (1939) were among the best short fiction of the period. Her command of the taut, sophisticated story was rivalled by two New Yorker writers, Irwin Shaw and John Cheever. Particularly in his first collection, Sailor Off the Bremen and Other Stories (1939), Shaw proved that it was possible to combine slickness and emotional depth. His later collection, Act of Faith and Other Stories (1946), was also widely praised for the same qualities. Cheever's The Way Some People Live (1943) was particularly successful in conveying the seriousness of the problems of adolescents and of young people in love. One of the stories in the volume, "Of Love, a Testimony," was as good a short story as the decade produced.

By far the most exciting talent in the field of the short story and novella was Katherine Anne Porter. Her three collections—Noon Wine and Other Stories (1937), Pale Horse, Pale Rider (1939) and The Leaning Tower and Other Stories (1944)—established her in the foreground of the decade's literature. In such stories as "Old Mortality," an ironic-sympathetic account of the development of a romantic, and "The Leaning Tower," a story about the rise of fascism in pre-Hitlerian Germany, she managed to suggest more than most good novelists tell in detail.

Poetry

If one could judge altogether from sales appeal, it would seem that poetry was altogether negligible—as indeed some critics said. Only two poems of the decade, Stephen Vincent Benét's Western Star (1943) and Russell Davenport's My Country (1944), were even briefly on the best seller lists, and neither was regarded as particularly eloquent by competent critics. But good poems were being written and read by the discerning and it seemed probable to some competent judges that the decade would be best remembered for the many excellent poets who wrote for too few.

Frost's Generation.-Robert Frost was the only one of the poets already distinguished before World War I who appealed to both the critical and to a relatively large public—a Pocket Book selection from his poetry appeared in 1946. His balanced shuttling between the grave and gay, his preference for colloquial language and for the rhythms of ordinary talk, made him superficially easy to comprehend, although there was often profundity enough under the easily understood surface. Collected Poems (1939), A Witness Tree (1942) and A Masque of Reason (1946) maintained a level of excellence comparable to that of his earlier volumes, and the first two were awarded Pulitzer prizes. Of the many more minor figures who superficially resembled him, the most gifted and individual in his own right was undoubtedly David Morton, whose Selected Poems (1945) revealed a genuine talent.

Frost's closest rival for combined public and critical appreciation was Robinson Jeffers, a somewhat younger poet whose first volume had been published a year before Frost's first volume, A Boy's Will (1913). Jeffers' angry, pessimistic and unconventional view of life, which contradicted all current American imperatives, was expressed in a style that the public at least superficially comprehended and enjoyed. Critics felt that there was no question of the eloquence and integrity of Such Counsels You Gave To Me (1937), Be Angry at the Sun (1941) and The Medea, Freely Adapted (1946). They hailed his Selected Poetry (1938) as evidence of the major quality of his work.

During the decade, Edna St. Vincent Millay continued to get more sales than praise. Most serious reviewers thought her ideas about contemporary affairs in Conversation at Midnight (1937) confused and confusing and her Huntsman, What Quarry? (1939) inferior to her best lyrical poetry. There was almost unanimous agreement about the hasty conception and execution of Make Bright the Arrows (1940) and The Murder of Lidice (1942), in both of which Miss Millay's patriotic heart got away from the command of her intelligence. The publication of her Collected Sonnets (1941) and Collected Lyrics (1943) proved, however, that Miss Millay was a talent to be reckoned with when her poetic intelligence asserted itself.

Two other poets who had once commanded a relatively

large audience declined in both critical and public esteem. Edgar Lee Masters, whose Spoon River Anthology had been a sensation in 1915, published too much that he had not digested poetically. Probably the best of his five books of verse was The New World (1937), but even this was not as readable as his biographies of Whitman (1937) and Mark Twain (1938). Carl Sandburg, who only published a few—and inferior—poems in Homefront Memo (1943), did not suffer as sharp a decline as Masters, for his Abraham Lincoln, which he completed in 1939, was recognized by both the public and the intellectual elite as one of the great biographies of the time.

Other poets who had established reputations during the "poetic renaissance" that followed the establishment of Poetry: A Magazine of Verse in 1912, continued to develop their talents for a small, discriminating audience. One of the most gifted of these was Conrad Aiken, a poet who combined psychological perceptiveness and an ability to put emotions and ideas into varied and appropriate musical patterns. His And in the Human Heart (1940), a moving collection of love sonnets, and his poems of city life, Brownstone Eclogues (1942), were superior to his ambitious failure, The Soldier (1944), an attempt to epitomize the totality of soldier experience throughout all time. He also published an excellent short novel, Conversation (1940), a vivid telling of a marital quarrel.

John Gould Fletcher, who at one time influenced Aiken and was influenced by him, deservedly won the Pulitzer prize for his Selected Poems (1938), but most of his volumes during the decade did not add to his reputation. Too many of them were diffuse narratives about his native state of Arkansas, such as those included in South Star (1941), but there were some superior tone poems, such as "Symphony of Snow" in The Burning Mountain (1946). Fletcher's autobiography, Life Is My Song (1937) was a movingly honest document and, with Harriet Monroe's A Poet's Life (1938), one of the best accounts of the renaissance that took place before World War I.

Two other participants in this renaissance enhanced their reputations during the decade. H. D. (Hilda Doolittle), who had been called the one pure imagist, showed herself in full command of her power to evoke emotion by her subtle free verse movement and by her fresh imagery in The Walls Do Not Fall (1941), while Alfred Kreymborg, unjustly neglected, proved that he deserved serious readers by the publication of Selected Poems (1945) and his wisely reflective poem, Man and Shadow (1946).

Although Ezra Pound's reputation as a poet was outweighed by his preference of Italian fascism to American democracy in the minds of many, he remained an important force in American letters by his publications in both poetry and prose. His controversial yet stimulating Culture (1939) and Polite Essays (1940) were carefully thought-out attacks on the established ideas about what makes a cultivated man, while his excessively difficult The Fifth Decad of Cantos (1937) and New Cantos (1940) were nevertheless considered interesting experimental verse by competent critics. A more lucid than usual canto appeared in the Sept. 1946, issue of Poetry, a magazine he did much to make into the vital force it had become in modern poetry, along with two appreciative essays by T. S. Eliot and R. P. Blackmur.

William Carlos Williams, a poet who was for some time associated with Pound in the early days when imagism was an important movement in modern verse, published much and well during the decade. His Collected Poems (1938)

revealed his unsurpassed ability to make poetry out of objects sharply seen and sharply expressed. The Broken Span (1941), The Wedge (1945) and, most of all, Paterson: Part One (1946), showed that his talent continued to develop. He also published a volume of short stories, Life Along the Passaic River (1938), and two novels, White Mule (1937) and In the Money (1940), books that further established his competency as an observer and interpreter of American life.

Two more conventional but able poets who started to publish before World War I continued to print good poems during the decade. Louis Untermeyer's activity as an anthologist tended to overshadow his work as a poet, but he published a competent translation of Heine (Heinrich Heine, Paradox and Poet) in 1937 and an autobiography that illuminated the development of modern poetry as well as his own life, From Another World (1939). Robert Hillyer's finished, soberly reflective, poetry, conservative in both substance and form, was at its most mature in A Letter to Robert Frost (1937), In Time of Mistrust (1939) and Pattern of a Day (1940).

Post-World War I Poets.-The idiom of T. S. Eliot, one of the great poets of the century, was adapted after World War I by a large number who did not share his views. Although the older poet's influence was more heavily apparent in Archibald MacLeish's earlier verse, Eliot's way with language and with unifying, unusual figures continued to influence MacLeish's publications during the 1930s. But MacLeish, like many of the poets of the decade, did not so much imitate Eliot as adopt his poetic devices. Certainly the matter of Public Speech (1936), Land of the Free (1938) and America Was Promises (1939) was MacLeish's own variety of social liberalism, while both the manner and matter of his radio plays in verse, The Fall of the City (1937) and Air Raid (1938), proved that he had assimilated Eliot and his other poetic ancestors.

Among the other post World War I poets who spent part of their poetic adolescence absorbing Eliot's technique were such diverse talents as John Peale Bishop, John Crowe Ransom, Marianne Moore, Wallace Stevens, Mark Van Doren, Louise Bogan, Genevieve Taggard and Allen Tate. Of these, Bishop, whose Selected Poems (1941) was his single publication in the decade during which he died, was the most derivative, but there were poems in this volume, particularly his elegiac poems, that succeeded in their own right.

Although he published a good deal of excellent criticism and edited the valuable Kenyon Review, John Crowe Ransom published poetry as sparingly as Bishop. His Selected Poems (1945), however, showed a poet who was too self-critical to allow anything merely derivative to enter his published work. In their deft intermingling of the tragic and the humorous, in their always effective and always present irony, they ranked among the most effective poems of the period.

Ransom's friend and co-worker in the earlier Fugitive group in Nashville, Tenn., Allen Tate, showed a similarly ironic awareness of the complexity of experience in his Selected Poems (1937) and The Winter Sea (1944), but he was usually more obscure and frequently a less sure judge of his own excellence than was Ransom. Though he usually seemed to be a less original poet than Tate, Mark Van Doren's frequent excellence was obscured by similar defects, as his Pulitzer prize winning Collected Poems (1939) revealed. His slim pamphlet volume, Our Lady Peace and Other War Poems (1942), appeared to reveal a more sure mastery of metaphysical practice and was cer-

Deer (1941).

Marianne Moore, with her syllabic metrics and her unusually effective use of symbolic animals as integrating devices, published some of the outstanding poetry of the decade. What Are Years? (1941) and Nevertheless (1944) were slender in size but large in quality. It is doubtful if any poet published a more effectively complex, yet moving, war poem than her "In Distrust of Merits" which appeared in the latter volume. Louise Bogan also published sparingly and well. Her The Sleeping Fury (1937) communicated an unusual sense of the beauty of intellection, while her Poems and New Poems (1941) revealed an intellectual ardour similar to that found in the later poetry of William Butler Yeats. Genevieve Taggard, another woman poet, combined a social leftism with a fondness for metaphysical devices. Her Collected Poems (1938) and Slow Music (1946) contained excellent poems, though these were too frequently buried beneath the mass of mediocre verse she allowed herself to publish.

With the possible exception of Ransom, Wallace Stevens was the most original of the poets who were once affected by Eliot's style. Since he was constantly preoccupied with the philosophical problem of the relation between reality and appearance, between the image and the thing symbolized, he was not a popular poet. There were not, however, many poets, ancient or modern, who had written more rewardingly of these themes than Stevens did in The Man with the Blue Guitar (1937), Notes Toward a Supreme Fiction (1942) and Parts of a World (1942), volumes in which he managed to give concrete form to philosophical concepts with rare felicity.

E. E. Cummings, who showed no trace of influence by the substance of either Stevens or Eliot, seemed to many to be original to the point of eccentricity. However, after readers and critics had gradually accustomed themselves to his apparently queer typography, he became increasingly recognized for the serious and distinguished poet he was. His Collected Poems (1938) revealed him as one of the most adept satirical and lyrical poets of the period and as one of the most insistent propagandists for living the good life of the senses. In his later Fifty Poems (1940) and I Times I (1944), he still further developed his original style by his unusual and effective use of verbs and indefinite pronouns, while his Santa Claus: A Morality (1946) showed that he was able to write as clearly as a more conventional poet.

Cummings was more likely to intrigue readers of the future than was one of the most conventional and popular poets of the decade, Robert P. Tristram Coffin, who published almost as steadily as Edgar Guest and sometimes descended to the latter's level of infelicity. In Collected Poems (1939), Primer for America (1943) and Poems for a Son with Wings (1945), Coffin spread himself too thinly over the entire American continent he had taken for his poetic province, but there were some poems about the Maine country and about his son that would earn him a higher reputation if they were selected and published separately. William Rose Benét and his brother, Stephen Vincent Benét, who died in 1943, would benefit similarly from careful anthologizing. They too took everything in America as their province and often came up with commonplace ideas and emotions that were tritely expressed. William Rose Benét's Pulitzer prize winning poetic autobiography, The Dust Which Is God (1941) was honest, illuminating and uneven. It was far superior to his often hysterically patriotic verse in Day of Deliverance (1944). The work of Stephen Vincent Benét was more individual,

and his long narrative, Western Star (1943), almost attained the excellence of his earlier John Brown's Body (1928). The verse in The Ballad of the Duke's Mercy (1939) and in The Last Circle (1946) was only occasionally successful, since Stephen Benét did not seem to have the ability to compress his substance into a short poem. Some good short stories, most of them about historical subjects, appeared in his volumes, The Last Circle, Thirteen O'Clock (1937) and Johnny Pie and the Fool Killer (1938).

None of these moderately popular, conventional poets did work of as high a quality as that of Witter Bynner, who had been publishing from 1907 but had not gained a reputation until the publication of his Selected Poems in 1936. Against the Cold (1940), his one volume for the decade, maintained the high level of vivid succinctness he had frequently reached in his own poems and in his admirable translations from the Chinese.

Whatever one may think of the success of their verse, it was undoubtedly true that Coffin and the two Benéts were honestly concerned with making American democracy work. Their work in this direction was surpassed, at least poetically, by the activity of a number of younger, unhappily less popular, poets: Langston Hughes, Paul Engle, Kenneth Fearing and Horace Gregory. Hughes published only one volume of poems, Shakespeare in Harlem (1945), during the decade, but that volume, in its effective use of blues rhythms to convey the troubles of Negroes, marked a clear advance above his earlier work. He also published an autobiography, The Big Sea, in 1940, which was an important help to understanding the Negro's justified dissatisfaction with his position in North American society.

Paul Engle, whose American Song (1934) was one of the more eloquent pleas for the democratic way, restricted his scope somewhat in the Iowa poem, Corn (1939) and in American Daughter (1945), but he showed an increasing mastery of form in these later volumes, both of which were more effective technically than his early Sandburgian verse. A more negative poet, who also tended toward the loose Sandburgian line, Kenneth Fearing increased his reputation as a critic of the abuses of democracy and as a singer of the loneliness of the average man. His Collected Poems (1940) were usually moving and always readable, while his Afternoon of a Pawnbroker (1943) showed that he was capable of a more disciplined style without any loss of clarity or scope. Horace Gregory shared many of the concerns of Hughes, Engle and Fearing, but he showed himself to be both a more difficult and a more original craftsman. Poems: 1930-1940 (1940) belonged clearly in the Eliot-metaphysical tradition, but it also showed that Gregory had absorbed his ancestors and developed an individual style, particularly in his later monologues about disheartened average people. With his wife, Marya Zaturenska, he published the most comprehensive history of American poetry the century had seen, American Poetry: 1900-1940 (1946), a thoroughly accurate guide to the poetry of the first 20 years of the 20th century, but a somewhat more prejudiced guide to the next 25 years. Miss Zaturenska (or Mrs. Gregory) revealed a good eye and a good ear in the reflective-descriptive poems that appeared in her Pulitzer prize winning Cold Morning Sky (1937), in Listening Landscape (1941) and in The Golden Mirror (1944).

Poets of the Decade.—Most of the poets whose reputations were largely or wholly made within the decade 1937-46, started out, at least, with a strong concern about the dangerous direction American society seemed to be taking.

Muriel Rukeyser, whose Theory of Flight had been hailed as an exceedingly promising volume when it appeared in 1935, was one of the most gifted and certainly the most prolific of these younger poets. In US 1 (1938), A Turning Wind (1939) and The Soul and Body of John Brown, she showed an uneven gift for revealing the interpenetration of the social and the personal in a metaphysical idiom that owed a good deal to the work of both Eliot and W. H. Auden. In her later Beast in View (1944), the style was more individual and the successful poems were more frequent. Miss Rukeyser was also the author of one of the best biographies of the decade, Willard Gibbs (1942).

Almost all of the poets who emerged as important talents shared Miss Rukeyser's admiration for the style of Auden and the Oxford poets, all of whom had felt the influence of Eliot. Because of the industrial background they shared and because of the influence of Auden, Stephen Spender and Louis MacNeice, all these young American poets wrote about factories, aeroplanes and city life with the same natural fascination with which 19th century poets had written of galleons and flowers. Like their British contemporaries, too, they wrote in a style that approximated the slangy-colloquial speech that was becoming increasingly common among even intellectuals, though they did not find this language incompatible with the exhibition of a great deal of metrical dexterity in the manipulation of a wide variety of conventional verse forms.

Karl Shapiro was the most widely praised and read of these young American poets. In Person, Place and Thing (1942) and V-Letter and Other Poems (1944), he wrote vividly and understandably of air raids, dead soldiers, movies and war-torn life generally with a penetration that transcended the contemporary subject matter. As his uneven Essay on Rime (1945) revealed, he had thought much and well about both the past and the possible future of poetry, and it seemed likely that he would completely outgrow all of his influences to become that unusual phenomenon, a poet who thinks and feels deeply yet communicates with absolute clarity. His closest rival among those who published at all frequently was Delmore Schwartz. His In Dreams Begin Responsibilities (1940), although it revealed the influence of the Oxford group, was particularly original in its use of a multiple focus in the dream play, Coriolanus. In Shenandoah (1941) and Genesis (1943), he wrote two long narratives that made effective poetic use of the Freudian insight that the child fathers the man.

Equally preoccupied with the interrelation of society and the individual and equally affected by the Oxford group and Eliot but somewhat less clearly original were Randall Jarrell, Jeremy Ingalls, Richard Eberhart, Thomas Merton, Robert Lowell, John Malcolm Brinnin, John Ciardi, Weldon Kees, John Frederick Nims, Dunstan Thompson and Oscar Williams. Randall Jarrell, who published Blood for a Stranger in 1942 and Little Friend, Little Friend in 1945, wrote movingly about World War II and the psychological environment from which it grew, but he also wrote too frequently with an almost wilful obscurity. Jeremy Ingalls' first volume, The Metaphysical Sword (1941), shared both the faults and the virtues of Jarrell's books, but her ambitious Tahl (1945), a long and sometimes successful narrative-philosophic poem, was frequently dull as Jarrell's books never were.

A dull diffuseness was also sometimes evident in The Lincoln Lyrics (1942) and No Arch, No Triumph (1946) by John Malcolm Brinnin. In working toward an individual style, which he sometimes achieved, he frequently lost the liveliness that characterized his earlier Audenesque; The Gurden Is Political (1941). Assuredly he seemed a less gifted poet than the frequently difficult, always interesting, Richard Eberhart. In Song and Idea (1940) and Poems New and Selected (1944), Eberhart wrote some of the best of the many poems about death and showed himself to be a constantly developing stylist. In The Man Coming Toward You (1940) and That's All That Matters (1945), Oscar Williams showed a similar capacity for stylistic growth and combined the idiom and substance of Auden with a modification of surrealist technique in some of his more effective poems.

Of quite different substance but of similarly derived styles were the three Catholic poets: Robert Lowell, Thomas Merton and John Frederick Nims. Robert Lowell, for his Land of Unlikeness (1944) and Lord Weary's Castle (1946), had easily the most distinguished reputation. His intensely bitter and passionately eloquent worldly and religious poems were something altogether new in the religious poetry of the 20th century, though they showed the influence of Auden, Hopkins and the surrealists. Thomas Merton's Thirty Poems (1944) and A Man in the Divided Sea (1946) were more derivative and more rarely eloquent, but there were many satisfying poems in both volumes. Despite the fact that he had only appeared in Five Young American Poets (1944), an interesting publishing experiment in which the "books" of five poets were included under one cover, John Frederick Nims seemed to some critics the equal of Lowell. Certainly no one had published more savagely successful satire than his "Dollar Bill" and "Apocalypse."

Like Nims, the other three poets affected by Auden and the Oxford group published little, but their little promised well. John Ciardi, who published Homeward to America in 1940, was perhaps the most gifted of the three, for he was able to write both lyrically and satirically with great effectiveness about subjects as varied and modern as those of Shapiro. Dunstan Thompson, in Poems (1943), was more uneven, but his elegiac poems were among the best written during the war years. Weldon Kees was at his best in satire and there were many good, biting poems in The Last Man (1943).

In this singularly rich poetic decade, there were many poets with less obviously determinable ancestors who might become as good or better than the poets just discussed. Kenneth Patchen was surely the most frequently printed poet of the decade, but his work was selected so uncritically that the early reputation he won with Before the Brave (1936) was almost lost. His Selected Poems (1946), culled from the six books he had issued earlier. re-established him as a gifted lyric and satirical poet, although even here there was too much that sounded more like Henry Miller versified than like Kenneth Patchen. He also published a number of surrealistic works in prose, of which The Memoirs of a Shy Pornographer (1944) was, oddly, the least shocking and the most interesting.

Kenneth Rexroth was probably a better poet. In What Hour (1940) and The Phoenix and the Tortoise (1944) contained many excellent lyric, reflective and erotic poems, but it was in the latter category that Rexroth most clearly matured his individual talent. In the sometimes derivative Wind the Clock (1941) and the unusually vivid narrative of Thomas Dorr's rebellion, The Sword on the Table (1942), Winfield Townley Scott also revealed a talent that could express itself in various media. Similarly varied were the talents of Rolfe Humphries in Out of the Jewel (1942) and of Robert Fitzgerald in A Wreath for the Sea

(1944), though Humphries' original gift was overshadowed by his reputation as a translator from the Spanish, and Fitzgerald's still more considerable talent was obscured by his unique excellence as a translator from the Greek.

Of the considerable number of other poets who published infrequently during the decade, all of the following were highly praised by discerning critics: Alfred Hayes (The Big Time, 1944); Josephine Miles (Local Measure, 1946); Jon Beck Shank (Poems, 1945); Ruth Lechtliner (Only the Years, 1945); James Laughlin (Some Natural Things, 1944); Theodore Roethke (Open House, 1942); Jean Garrigue (Thirty-Six Poems and a Few Songs, 1944; The Ego and the Centaur, 1946); Theodore Spencer (The Paradox in the Circle, 1941; Act of Life, 1944); Marguerite Young (Moderate Fable, 1944); Howard Nutt (Special Laughter, 1940); Clark Mills (Speech after Darkness, 1942; The Circus, 1945); Hortense Flexner (North Window, 1943); Elizabeth Bishop (North and South, 1946); Babette Deutsch (One Part Love, 1939; Take Them, Stranger, 1944); R. P. Blackmur (From Jordan's Delight, 1937). It was quite impossible to exclude from any account of the poetry of the decade the amusing, sometimes meaningful, usually too prolix Ogden Nash, whose The Face Is Familiar (1940) was a selection of his best verse. (See also POETRY.)

Literary Criticism

Allied to poetry in both its usual excellence and in its usual failure to find many readers was the field of literary criticism. Van Wyck Brooks, however, managed to combine critical distinction with great popular appeal in two successors to the best-selling Flowering of New England (1936). New England: Indian Summer (1940) continued his familiar method of blending history, biography and a minimum of critical judgment in order to recreate the atmosphere in which the writers themselves lived. So did The World of Washington Irving (1944), although neither the critics nor the public received this volume with as much enthusiasm as they had accorded to the two predecessors. During the decade he also published The Opinions of Oliver Allston (1941), a sometimes ill-tempered book in which he assailed many "great" later writers for their decadence and thereby showed what some critics had suspected from his otherwise fine literary history: Brooks was not as sensitive to literary values as he was to moral values.

His closest rival in popularity was Bernard De Voto, who also published an ill-tempered attack upon writers who reflected the disillusionment of the 1920s and early 1930s-The Literary Fallacy (1944). In his Mark Twain at Work (1942) and The Year of Decision (1943), he made distinguished and temperate contributions to the history and literature of the 19th century. Henry Seidel Canby's critical biographies were as justly popular as De Voto's excursions into literary history and history. Thoreau (1939) and Walt Whitman (1943) were generally acknowledged to be definitive critical biographies, thorough in scholarship and in appreciation. Equally valuable as criticism and somewhat above the average in popularity were the books published by Jacques Barzun. Darwin, Marx, Wagner: Critique of a Heritage (1941) and Romanticism and the Modern Ego (1943) were excellent studies in the background of modern thought, while Teacher in America (1945) was surely the most engaging and possibly the most valuable of the host of books about the deficiencies of modern education that appeared during the decade.

It was rather doubtful, however, if any of these critics would be read as long or as thoroughly as Edmund Wilson. A gifted creative writer in his own right (the much-dis-

cussed Memoirs of Hecate County, 1946) and the book editor of the New Yorker, Wilson had an unusual ability for combining literary and sociological perceptiveness. His studies of such older writers as Dickens and Kipling in The Triple Thinkers (1938) and The Wound and the Bow (1941) were quite as discerning as his early book on the symbolist movement, Axel's Castle (1931), while his history of the development of socialist thought, To the Finland Station (1940), despite its occasional unnecessary acrimony, was one of the best works in intellectual history printed during the decade. His study of the hard-boiled school of American writers, The Boys in the Back Room (1941), was a valuable, though sometimes dubiously subtle, addition to the criticism of literature.

In many ways an equally gifted critic, though his early The Great Tradition (1933) had been overly orthodox in its Marxism, Granville Hicks published only one work of specific literary criticism during the decade. This book, Figures of Transition (1939), a study of end-of-the-century writing in England, was notable for its admirable relating of intellectual and social history to literary value, and stood as one of the decade's best studies of English literature. Hicks' other publications during the period included three good novels (The First to Awaken, 1940; Only One Storm, 1942; Behold Trouble, 1944) and two interesting combinations of autobiography and sociology, I Like America (1938) and Small Town (1946).

Like the critics already discussed, Newton Arvin was more interested in intellectual and social values in literature than in aesthetic exploration. His Whitman (1938) was by far the best study of the poet's thought yet written, while his edition of Hawthorne (1946) was a model of critical intelligence. Among the other able works of criticism stressing intellectual and social values were Bernard Smith's Forces in American Criticism (1939), Eric Russell Bentley's examination of the writers who wrote of the superman, A Century of Hero Worship (1944) and The Playwright as Thinker (1946), Maxwell Geismar's book on contemporary literature, Writers in Crisis (1943) and Alfred Kazin's survey of American prose literature, On Native Grounds (1942). Another able student of American literature and ideas, Howard Mumford Jones, published only one book that was definitely concerned with the American literary scene, Ideas in America (1944), but he also published a first-rate biography of Thomas Moore, The Harp that Once ... (1937) and a provocative study of the insularity of the literature curriculum in the American college, Education and World Tragedy (1946).

The most original, influential—and sometimes the most pretentiously esoteric-school of criticism of the decade centred about such little magazines as The Southern Review and The Kenyon Review, periodicals published at U.S. colleges and edited by men of letters who were also professors. The gifted poet, John Crowe Ransom, editor of The Kenyon Review, was perhaps the most talented of the group. In his collection of critical essays, The World's Body (1938) and his examination of the basic ideas in modern criticism, The New Criticism (1941), he showed an unusually subtle, though sometimes overdogmatic, grasp of the complexity of the artistic experience. His essay on metaphysical poetry in The World's Body, together with the book of his co-editor, Cleanth Brooks, Modern Poetry and the Tradition (1939), was basic to an understanding of modern poetic theory and practice.

Most of the contributors to these magazines shared Ransom's convictions about the literary process and were sim-

ilarly astute and close critics. The poet, Allen Tate, in his Reason in Madness (1941), and the critic, R. P. Blackmur, in his admirable The Expense of Greatness were among the most gifted of the critics of this school. They applied the ideas they shared in common with individual acumen to a variety of contemporary and precontemporary writers. A similarly close critic, Yvor Winters, shared with these southern reviewers a concern for careful, subtle reading, but he also shared with such earlier critics as Irving Babbitt and Paul Elmer More a great concern for the moral impact of literature. In Primitivism and Decadence (1937), Maule's Curse (1938) and Edwin Arlington Robinson (1946), he pursued his enemy, the romantic idea, with intelligence and somewhat too much zealotry.

Kenneth Burke, a more powerful and a more unclassifiable critic than any of the southern reviewers with whom he was frequently published, wrote illuminatingly about history, sociology, literature and psychology without ever forgetting the interrelationships among the four. In Permanence and Change (1937), Attitudes toward History (1937), The Philosophy of Literary Form (1941) and A Grammar of Motives (1945), he erected a system that combined many of the best insights of the southern reviewers, the Marxists, the Freudians and the semanticists.

There were other excellent critics who were not as difficult to understand as was the school loosely grouped around Ransom. Lionel Trilling's critical biography, Matthew Arnold (1939) was a study of a key figure in the 19th century who remained an important influence upon the 20th, while his E. M. Forster (1943) could serve as a model of what the good critical biographer should do. An equally important and equally lucid critical biographer of the decade was F. O. Matthiessen. He had already established his reputation as a critic who understood the importance of a man's times, life and theory of art in the creation of his work, in The Achievement of T. S. Eliot (1940); but his American Renaissance (1941), a study of the flowering of New England that surpassed Van Wyck Brooks' work in critical depth, and his critique of the later novels of Henry James (Henry James, the Major Phase, 1944) definitely established him in the foreground of American criticism. With him in their sense of the multiple factors that go to make up the effective work of art were Mark Schorer, who published his definitive William Blake in 1946 and Herbert Muller, whose Modern Fiction (1937) was perhaps the best study of the modern novel that had yet been published and whose Science and Criticism (1943) was both well informed and a suggestive basis for the further development of a criticism that was indebted to but not subservient before modern science.

Biography and Autobiography

Much of the criticism discussed above was biographical, while much of the so-called pure biography of the decade 1937–46 was mixed with a great deal of social, historical and literary criticism. The difference lay in the emphasis. Biographical information was incidental to critical appraisal in such a book as Lionel Trilling's E. M. Forster; in such a book as Joseph Wood. Krutch's Samuel Johnson (1944), critical evaluation was secondary to a full revelation of the life of the man. Krutch's biography of Samuel Johnson was generally regarded as one of the best biographies of a literary man published during the decade.

Probably Carl Van Doren's Benjamin Franklin (1938) was similarly definitive. Van Doren uncovered a great deal of new information about the public and private life of

Franklin and saw him as neither god nor devil. Van Doren also published *The Secret History of the American Revolution* (1941), important for its new data and new interpretation.

Whether Herman Hagedorn's Edwin Arlington Robinson (1938) or Philip Horton's Hart Crane: the Life of an American Poet (1937) were as definitive as the biographies of Krutch and Van Doren was difficult to say. Although as a critical evaluation of the poetry it was inferior to Yvor Winters' short Edwin Arlington Robinson (1946), there could be little doubt that there was no better biography of Robinson available than Hagedorn's sympathetic but perhaps too reticent account of the life of his friend. A more judicious mixture of biography and criticism, Horton's Hart Crane was a thoroughly scholarly life of one of America's most interesting poets.

The two biographies written by Matthew Josephson were usually adjudged illuminating by the critics, although there were some who felt that Josephson was not as incisive as Horton and Krutch. Josephson's Victor Hugo (1942) and Stendhal (1946) were unusually well adjusted to the taste of the general public, however, and brought many readers to the work of the men themselves. Probably Josephson was at his best in the continuation of the series of biographical panoramas he started with The Robber Barons (1934). The Politicos (1938) and The President Makers (1941) rounded out his severely critical portrait of what was perhaps the most corrupt period in U.S. history, the years between the death of Lincoln and the election of Theodore Roosevelt.

Catherine Drinker Bowen, the most popular biographer of the decade, was also one of the best. Her first success was the perceptive, well-informed, popularly written Beloved Friend (1937), an account of the relationship between Tschaikovsky and Nadejda von Meck. Yankee from Olympus (1944), a biography of Justice Oliver W. Holmes firmly set in the background of the distinguished Holmes family, was high on the best-seller lists for more than a year. It was a remarkable example of biography that managed to please the public without any sacrifice of critical integrity or factual accuracy. It was likely, though, that her biographies were not as comprehensive or as definitive as Marquis James' Andrew Jackson: Portrait of a President (1937) or Allan Nevins' John D. Rockefeller: the Heroic Age of American Business (1940). Nevins' biography was, however, frequently criticized.

Of the numerous autobiographies produced during the decade, none combined excellence and popularity more effectively than Clarence Day's amusing, serious and illuminating Life with Mother (1937) and Life with Father (1936). Pierre van Paassen's quite different Days of Our Years, which topped the best-seller lists for 1939, was probably the most illuminating reporter's account of himself and his times that appeared. In its anticipation of the approaching war, it was a prophetic book, as well as a brilliant record of what Van Paassen had seen and felt and thought. An equally thoughtful but less popular book was Oswald Garrison Villard's telling of his life as a proponent of liberalism, Fighting Years (1939). In this autobiography, too, one could sense the inevitability of war and understand better the forces that made it inevitable. A similar illumination could have come from reading The Letters of Lincoln Steffens (1938), for these collected letters amplified and clarified the account of Steffens' growth to understanding of the contemporary world that he himself had given so brilliantly in the Autobiography (1931).

The most distinguished autobiographical writing of the decade was the series of volumes published by H. L.

Mencken and George Santayana. There was great contrast in their distinctions. Santayana's beautifully quiet prose, telling of a life in which ideas had been the main events, formed a marked antithesis to Mencken's polysyllabic Americanese, telling of a life in which conflict and shocking the public were outstanding. Mencken's as yet incomplete narrative about himself was contained in Happy Days (1940), Newspaper Days (1941) and Heathen Days (1943), while Santayana's similarly incomplete series about himself was found in Persons and Places (1944) and The Middle Span (1945). During the decade, Mencken also published the first supplement to his magnificent The American Language (1936) in 1945, while Santayana published one of his most important philosophic discourses, The Realm of Truth (1937), which, with John Dewey's Problems of Men (1946), ranked among the great works of 20th century philosophy.

The only other autobiographies of the decade that seemed reasonably sure to remain of permanent interest were those by Mabel Dodge Luhan, W. E. du Bois and William Alexander Percy. Mrs. Luhan's sometimes naive and always superlatively frank record of her intimate memories was continued in Edge of Taos Desert (1937), which contained some particularly valuable material about D. H. Lawrence. Percy's Lanterns on the Levee (1941) was the life story of a sensitive southerner's attempt to adjust to an increasingly Yankee-dominated world. It could usefully be read as a contrast to Du Bois's narrative of his difficult adjustment to a white man's world in Dusk of Dawn (1940).

History

Charles and Mary Beard still maintained their position as leaders of historians with a reasonable claim to regard as literary figures. Although America in Midpassage (1939), perhaps because of the close perspective from which the 1930s in the U.S. had to be viewed, was generally thought inferior to The Rise of American Civilization (1927), everyone agreed upon its excellence as history and as literature. There was less general agreement about the merits of Basic History of the United States (1940), in which the Beards seemed to have been overinfluenced by their growing preference for American isolation, while there were many who disagreed with Beard's Giddy Minds and Foreign Quarrels (1939) and A Foreign Policy for America (1940), books in which he emphatically disagreed with the growing American tendency to feel itself involved in European conflicts. There were few, however, who did not admire The Republic (1943), a winning series of dialogues about the theory and practice of American politics.

No one else of literary distinction was as prolific as the Beards, but there were a number of notable and wellwritten historical volumes published during the decade. Two of the best were about the south. Douglas Southall Freeman brought to a close his definitive Lee's Lieutenants in 1944, and W. J. Cash published his excellent The Mind of the South in 1941. Arthur M. Schlesinger Jr.'s The Age of Jackson (1945), a work written with a conscious eye upon the analogies between the age of Roosevelt and the age of Jackson, started with the south but included all America in its province. With The Triumph of American Capitalism (1940) by Louis M. Hacker, The Age of Jackson was probably the best historical work of great scope produced during the decade. There were, however, three works in U.S. intellectual history that equalled these two good books in quality. Constance Rourke's The Roots of American Culture (1942) was a basic study of the interrelationships between U.S. culture and folkways, written with great charm and grace. Merle Curti's Growth of American Thought (1943) was generally judged a worthy rival to Vernon Parrington's Main Currents in American Thought, while Ralph Barton Perry's Puritanism and Democracy (1945) was usually considered a definitive contribution to the history of American thought as well as a provocative work in philosophy.

Reportage.—Because of the increasing tension in world affairs throughout the decade and the increasing public curiosity about the international situation, reporters wrote and published more books than ever before. A good many of these were inferior, full of snap judgments and inadequate information, but there were more than a few with literary distinction. Vincent Sheean was still perhaps the most notable of these reporters, although he did nothing that was quite as good as his Personal History (1935), which had been widely acclaimed as one of the most thoughtful autobiographies of the century. In his later books, there was less of himself, more of world events. Not Peace But a Sword (1939), an able analysis of what was happening in pre-Munich Europe, was succeeded by Between the Thunder and the Sun (1943), an account of the early war years, and This House Against This House (1946), a less satisfactory analysis of the troublesome conflicts that continued after World War II.

John Gunther rivalled Sheean in the scope he covered, but most informed critics felt that there was a descending scale of excellence from his Inside Asia (1939) to his Inside Latin America (1941). His reputation was overshadowed by that of a number of war reporters, of whom Ernie Pyle was the most distinguished representative. In Here Is Your War (1943) and Brave Men (1944), the humble and eloquent Pyle managed to catch the mingled pathos, humour and heroism of the common soldier as it had never been caught before. The reportage of John Hersey was nearly as good. His story of the fighting on a Japanese island in the Pacific, Into the Valley (1943), and his mordant account of the bombing of Hiroshima (Hiroshima, 1946) were unusually perceptive, while his novel, A Bell for Adano (1944) was more interesting as a report of mismanagement in the military government of Italy than it was as a piece of fiction.

It was difficult to single out among the many others. Surely Ira Woolfert's Battle for the Solomons (1943) and Richard Tregaskis's Guadalcanal Diary (1943) deserved more than brief remembrance. So did William L. White's account of the horrible, problematically necessary, expenditure of some lives in war time, They Were Expendable (1942) and Bill Mauldin's Up Front (1945). It was probable, too, that William L. Shirer's Berlin Diary would be adjudged finally the best of the I-was-in-Germany-when books that flooded the market during the early 1940s.

Social and Cultural Criticism

The decade was rich in writers who made earnest and frequently successful attempts to convince the public that there were ways out of the seeming impasse western civilization reached in the years immediately preceding and during World War II. One was Max Lerner, editor of P.M. In It is Later Than You Think (1938), he called for a common front against totalitarianism, whether of the right or of the left. In his two succeeding books, Ideas Are Weapons (1939) and Ideas for the Ice Age (1941), he continued to preach the importance of right thinking as a weapon against the foreboding future. The philosophertheologian Reinhold Niebuhr was similarly concerned with the importance of right thinking as a guide to effective

action. In his The Children of Light and the Children of Darkness (1944), he carried over into popular form his attack upon the sentimental conception that there is no such thing; he had first presented this attack in his The Nature and Destiny of Man (1941 and 1943), one of the important philosophical works of the century.

Sharing with both Niebuhr and Lerner many common ideas about the necessary basis for a good future, Stuart Chase, Lewis Mumford and Louis Adamic attacked more particularized aspects of the problem. In such books as The Culture of Cities (1938) and The Condition of Man (1944), Mumford pointed out the way in which the development of technology had affected the destiny of man and looked forward to an age of more humane men in a more humanely technological society. Louis Adamic, himself a naturalized American, attempted in his books (From Many Lands, 1940; Two-Way Passage, 1943; A Nation of Nations, 1945) to make America aware of the troubles of immigrants and minorities in the U.S. and to induce a more actively liberal attitude. He also published an interesting book about Yugoslavia, My Native Land (1943), and a provocative account of the relations between Churchill and Roosevelt, Dinner at the White House (1946).

In addition to a number of books about the tragedy of waste in an economy that could make ample provision for all (Idle Men, Idle Money, 1940; Democracy Under Pressure, 1945), Stuart Chase wrote what was the most popular introduction to the new science of semantics (q.v.) which intended to make people more aware of the merely verbal source of many social misunderstandings. This book, The Tyranny of Words (1938), was followed by a number of similarly oriented books such as S. I. Hayakawa's Language in Action (1941), an accurate and brilliantly written primer for the uninitiated, and Wendell Johnson's excellent People in Quandaries (1946). Thurman Arnold's earlier The Folklore of Capitalism (1937), a satirical account of many less rational beliefs under capitalism, anticipated much of what the later semanticists had to say.

Closely allied to the semanticists in their belief that modern society required more rational conduct and a more honest recognition of frequent irrationality, were such anthropologists as Margaret Meade and Ruth Benedict and such psychiatrists as Karl Menninger and Karen Horney. Ruth Benedict's The Chrysanthemum and the Sword (1946) was a notable attempt to apply this kind of reasonableness to Japanese society, while Margaret Meade's Keep Your Powder Dry (1942) applied a similarly objective rationality to civilization in the U.S. In a series of books that included Man Against Himself (1938) and Love Against Hate (1942) by Karl Menninger and The Neurotic Personality of Our Time (1937) and Our Inner Conflicts (1945) by Karen Horney, publicists for psychoanalysis tried to show harried modern man how he could better order and sublimate his inherent irrationality.

After starting her career with an amusing attack on the English. With Malice Toward Some (1938), Margaret Halsey published two of the decade's most popular and effective indirect pleas for tolerance: Some of My Best Friends Are Soldiers (1943) and Color Blind (1946). Particularly in the latter book, she made a winning plea for more general acceptance of Negroes as complete equals. On a somewhat less popular level, St. Clair Drake and Horace Cayton's Black Metropolis (1945), a study of the Negro section of Chicago, pointed to the great need for accepting Negroes as first-class citizens, as did Arna Bontemps and Jack Conroy's They Seek a City (1945), a study of

Negro migration in the U.S. Similarly, Robert S. Lynd and Helen Merrell Lynd's *Middletown in Transition* (1937) indicated the need for greater tolerance in the U.S.

The most effective conservative social critic of the decade was undoubtedly Walter Lippmann. In his carefully reasoned *The Good Society* (1937) and his popular and logical *U.S. Foreign Policy* (1943), he outlined the possible structure of an effective internal and external policy for the *U.S.*

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No Account of the decade 1937-46 would be complete without mention of such thoroughly unclassifiable writers as Henry Miller, Gertrude Stein and James Thurber. Thurber was most generally known as a humourist, and he was certainly a delight for tired minds. But he was serious as well, and there was much in Let Your Mind Alone (1937), My World-And Welcome to It (1942) and his collection, A Thurber Carnival (1945) that was vital criticism of the frequently neurotic American way. The Selected Writings of Gertrude Stein (1946) and Wars I Have Seen (1945) revealed that Miss Stein should be taken seriously too. Because of the excessive difficulty involved in reading much that she wrote, she had foo frequently been dismissed as an eccentric. In similar fashion, Henry Miller had been too frequently dismissed as a pornographer. In attempting to move toward a more notably happy decade, readers might make greater mistakes than reading the eloquent savagery of Miller's two best books, The Cosmological Eye (1939) and Sunday After the War (1944). (See also Book Publishing; English Litera-TURE; FOLKLORE, AMERICAN.)

BIBLIOGRAPHY.—Joseph Warren Beach, American Fiction: 1920–1940; Maxwell Geismar, Writers in Crisis; Horace Gregory and Marya Zaturenska, A History of American Poetry: 1900–1940; Alfred Kazin, On Native Grounds; Louis Untermeyer, Modern American Poetry; Oscar Williams, New Poems (1940, 1942, 1943, 1944). (H. C. Wr.)

American Medical Association

See Societies and Associations.

American National Red Cross

See RED CROSS.

American Newspaper Guild

See Newspapers and Magazines.

American Samoa

See SAMOA, AMERICAN.

American Society of Civil Engineers

See Societies and Associations.

American Society of Composers, Authors and Publishers

See Music; Societies and Associations.

American Society of Mechanical Engineers

See Societies and Associations.

American Youth Commission

See EDUCATION.

Ameripol

See RUBBER.

Amsterdam

The capital of the Netherlands showed a certain economic recovery in the year 1937, as the result of which the

general unemployment figure fell to 25.7%. The steadily increasing international trend toward autarchy, particularly in Germany, continued to exercise an untavourable influence on the economic situation of the city. In the year 1938 especially it became clear that a world-wide conflict was inevitable, and consciousness of this set its seal on many aspects of Amsterdam's life. The following spring, the city was full of newly mobilized Dutch troops, yet for a year the terrors of war remained outside its walls. On May 10, 1940, German aircraft bombed Schiphol airport; five days later German troops occupied the city. The measures taken against the Jewish inhabitants (10% in total) roused the resistance of the population. Feb. 25. 1941, the day on which tens of thousands went on strike as a protest against the persecution of the Jews, was a milestone in the history of the city. The year 1944 was marked by the so-called "Mad Tuesday" (Sept. 5) on which the retreat of the German troops and the panic flight of the quislings seemed to be the prelude to speedy liberation. Hope of this, however, was destroyed after the failure of Arnhem (Sept. 17-28). Schiphol airport was totally devastated and the seaport badly damaged. Stoppage of rail and tramway traffic, the cutting off of gas and electricity supplies followed quickly. The already scanty rations continued to be cut; thus a state of emergency arose; thousands of people (both young and old) died of cold and starvation. The following year started with a continued increase of the distress; more and more areas around the town were flooded; the situation became precarious.

The liberation of the city on May 5, 1945, saved tens of thousands from famine; a week before, Allied food supplies dropped by air had already met the very worst needs. But still the weight of 44,000 of the city's inhabitants was 25% below normal; it was recorded that 25,000 citizens were suffering from hunger-oedema. In the second half of the year restoration of what was most necessary took place. As soon as the harbour and airport were opened, supply of gas and electric service was resumed. The year 1946 saw the first transatlantic air traffic. Municipal elections in July showed a left-wing majority (Labour 31%, communists 32%). In all branches of civic life, reconstruction and recovery were forging ahead.

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AMVETS (American Veterans of World War II)

See Societies and Associations.

Anaemia

The stimulus to knowledge of the blood given by the work of G. R. Minot and W. P. Murphy in 1926 (on the action of liver in producing remissions in pernicious anaemia), carried over into the 1937–46 decade. Efforts were made to discover the nature of the active material in liver extract, and experiments suggested that it was a biuretnegative peptide. The chemical formula was not developed.

Pernicious Anaemia.—Many studies were made on the nature of the process in the stomach which developed the material that causes maturation of the red blood cells. Experiments suggested that a substance, probably the enzyme haemopoietin, secreted by the body of the human stomach (or the pyloric region in the hog) reacted with a constituent of the food and produced a material which was stored in the liver. This substance ("liver extract").

on reaching the bone marrow, enabled immature red blood cells (megaloblasts) to develop into mature cells. A defect in available liver extract caused the development of large red cell (macrocyte) anaemias, such as are found in pernicious anaemia, tropical macrocytic anaemia, achrestic anaemia, sprue, pellagra, some patients with gastric carcinoma and certain nutritional anaemias. Removal of the stomach in man and animals gave different results in the hands of various operators, most frequently being followed by an anaemia with small red blood cells, although a few instances of macrocyte or large red cell anaemia were reported. The atrophic appearance of the stomach in pernicious anaemia so that the tissues appeared as if dead, improved during a remission, although the ability to secrete haemopoietin was not recovered.

. Bone Marrow Puncture.—During the decade 1937–46. bone marrow puncture, both for diagnostic purposes as well as for transfusion of blood and fluids in anaemia. became a routine procedure. The red cells are formed in the bone marrow.

Colon bacilli were found throughout the gastro-intestinal tract, from the stomach to the colon, in patients with pernicious anaemia in relapse. The neurological symptoms in this disease, present in some form in from 70% to 90% of the patients, were favourably influenced or their progress was checked by the use of liver preparations, desiccated stomach, vitamin B_1 , other vitamins, yeast and folic acid.

Potency of Liver Extract.-Numerous attempts were made to find a suitable method of determining the potency of liver extract, since chemical means were not available. The effect of liver was studied on the size and development of red blood cells in the immature opossum, in rat embryos, chick embryos, guinea pigs, in isolated bone marrow preparations, in dogs, in animals with their stomachs removed, or with bile fistulas, on special diets, or poisoned with various chemical substances. None of these came into common use during the decade. The use of untreated people with pernicious anaemia remained the only suitable test for the power of liver extract and the measurement of the increase in the number and percentage of reticulocytes-immature red cells-and the rate of increase in the number of red blood cells was adopted as the standard. A quantitative relationship between the initial red blood cell count at the beginning of intramuscular liver therapy in pernicious anaemia and the maximum percentage of reticulocytes which appeared in the blood stream during the following two weeks was expressed by a mathematical formula. The familial incidence of pernicious anaemia was reported as from 7.9% to 18.7% in different surveys.

The treatment of pernicious anaemia became standardized, and the intramuscular injection of the remedy was found to be the most economically effective. Folic acid, thiamine and similar substances (vitamin B_c, vitamin M, norite eluate factor) were found to be effective in the treatment of macrocyte anaemias.

Macrocyte Anaemias.—Many types of macrocyte anaemia were studied. A nutritional type was described in men and animals on deficient diets, in pregnancy, after gastrointestinal operations (entero-enterostomy), in liver disease, in achrestic anaemia, in some tropical diseases, in malaria, in children, idiopathic steatorrhoea, in carcinoma of the stomach and in other conditions. Some of these responded to the folic acid group of substances, whether concentrate (yeast, liver, spinach) or the synthetic form. As with

pernicious anaemia, a transitory swelling of the feet and legs was noted during the early remission in macrocyte anaemias.

Iron Deficiency Anaemias.—Iron deficiency anaemias in animals were studied extensively, and observations on man were recorded. Ferrous iron is more readily absorbed in man than ferric iron or organic combinations, but this varies in animals. Animals are favourably influenced by copper and cobalt. Radioactive iron was used to "tag" haemoglobin, and thus observers could follow its formation and metabolism in the body. Tagged iron was found in red blood corpuscles of anaemic dogs four to eight hours after ingestion. Iron phytate was less readily absorbed than ferrous sulphate. While radioactive iron was absorbed only in traces in nonanaemic dogs, it was taken up abundantly when there was iron deficiency. The absorption appeared to depend more on the reserve iron store than on the degree of anaemia. About 70% of iron injected intramuscularly was used for regeneration of haemoglobin, the red colouring matter of the blood. When given orally, multiple small doses of iron were more efficient than single large doses in causing regeneration of haemoglobin.

A number of surveys of groups in different parts of the world were reported, with special reference to the incidence of anaemia. In communities in England, the United States, India, Africa, and in the Shoshone Indians, studies showed the prevalence of iron deficiency anaemia, especially where there were dietary inadequacies.

Iron deficiency anaemia was found in 9.0% to 72% of pregnant women. In breast-fed infants it was less common (26%) than in bottle-fed ones (35%). In adults it varied from 3.6% to 30.0% and in children from 1.5% to 85.0%. In 2,205 rural school children in Florida, 42.3% had haemoglobin values in the range of 3.6 to 11.4 grams per 100 c.c. secondary to dietary, especially iron, deficiency. Two-thirds of the natives of northwest India showed lack of haemoglobin (hypochromia) and iron deficiency, associated with an inadequate iron intake. In Manchester, England, anaemia was found in 58% of 201 children (10 weeks to 14 years).

Significance of the Rh Factor.—Of outstanding interest was the discovery that a group of substances, the "Rh factor," was present in the red blood corpuscles of about 85% of the population. This substance was antigenic when injected into a person who did not possess it (Rh negative). The substance thus developed in the blood of Rh-negative people agglutinated red blood cells of Rh-positive people. An Rh-positive foetus in an Rh-negative mother caused her to develop antibodies which produced erythroblastic anaemia in subsequent Rh-positive children. An Rh-negative person who had developed Rh antibodies (from an Rh-positive blood transfusion, or from bearing an Rh-positive child from an Rh-positive husband) could not receive a transfusion of Rh-positive blood, as a severe haemolytic reaction, destroying red blood cells, and often fatal, resulted. Many subgroups or subtypes and correlated factors were discovered. The Rh factor was found to be inherited as a dominant character, through six allelic genes,-Rho Rh1 Rh2 Rh', rh and Rh". The incidence in England and in the U.S. was similar, but Rh-negative people were 21 times less frequent among the Chinese, and erythroblastosis was rare. The subtypes were postulated as factors in haemolytic blood transfusions and in erythroblastosis foetalis. The latter condition caused 2.2% of foetal deaths, and 2.8% of

those in infants. Haemorrhagic disease of the newborn was fatal in 2.1% of a group of infants. In one study, 21 cases of haemolytic disease in the newborn, 19 of the mothers showed anti-Rh agglutinins in their blood and in the breast milk in 7 of 10 patients examined. A preponderance of the fathers of children with haemolytic anaemia, as in the case of erythroblastosis foetalis, were homozygous Rh-positive. Erythroblastosis was almost twice as common among children of Rh-negative women who had been sensitized previously by transfusion, than in those not so affected. Haemolytic anaemia, secondary to Rh-antibodies, was the initial cause of erythroblastosis foetalis, and by damage to the tissue of the liver, gave rise to many of the complex manifestations of the disease. The titer of anti-Rh substance was highest in mother and child, 8 to 20 days after delivery. Transfusions of Rh-negative blood through the umbilical cord in a prematurely delivered Rhpositive infant exposed to anti-Rh substance, was followed by recovery. Erythroblastosis foetalis was not always present in infants when Rh-antibodies were present in the maternal circulation. Erythroblastosis was reported in children of Rh-positive mothers, suggesting other possible

Haemolytic Anaemia.—Many cases of haemolytic types of anaemia were reported. A haemolysin in the blood was postulated, sensitizing the cells so that they were destroyed by the spleen or reticulo-endothelial cells elsewhere. Haemolytic reactions developed in some patients with cold agglutinins. In Marchiafava-Micheli (paroxysmal nocturnal haemoglobinuria) anaemia, visible haemolysis developed in clotted blood after six hours at 37°C. Following the general introduction of the sulfonamide compounds (sulfanilamide, sulfathiazole, sulfadiazine, sulfapyridine) into medicine, many instances of haemolytic anaemia were reported. In this condition, pigment metabolism and renal failure resembled that in blackwater fever, haemolysis after incompatible transfusions, haemolytic jaundice and haemolysis from various drugs. A haemolytic anaemia followed the feeding of choline to dogs, with rapid recovery after cessation of the administration of the drug. The anaemia was hyperchromic, responding to anti-pernicious anaemia treatment. The haemolytic reactions resulting from isoimmunization following repeated transfusions of homologous blood developed according to a mechanism similar to that affecting the erythroblastic foetus and endangered the life of transfused anaemic mothers. Several factors relating diet and haemolytic anaemia were noted. The anaemia produced by para-amino-benzene was prevented by a high protein diet. Increased destruction of red blood cells followed diets rich in fat. Rats on a high fat diet developed a severe anaemia after trinitrotoluene poisoning, but were protected by a high protein or carbohydrate intake.

A number of studies were made, especially on animals, using various diets and medicines to learn the best treatment for iron deficiency anaemias, and accumulate knowledge about haemoglobin regeneration. Cobalt and copper appeared to enhance the utilization in some animals, but not in others. The iron of egg yolk, spinach and blood was not easily digested, and under some circumstances (achlorhydria, achylia) only a very little was used. Careful studies were made of the amino acids essential for haemoglobin regeneration in animals. Molasses (concentrated syrup from cane sugar) was found to be an easily available source of iron. Growing rats developed anaemia when placed on a milk diet which was not relieved by the addition of lactalbumin, corn, wheat gluten or iron, but was helped by copper, casein and similar substances.

Pyridoxine deficient diets produced a microcytic hyperregenerative anaemia in swine, corrected by pyridoxine administration. There was no increase in haemolysis in pyridoxine deficiency anaemia in swine, but ferraemia and haemosiderosis were the result of nonutilization and decreased excretion of absorbed iron. Vitamin B_{θ} , a constituent of liver extract, cured anaemia of certain types in chicks. An erythropoietic substance developed in the serum of rabbits rendered anaemic by bleeding. Diets low in protein, pantothenic acid, casein hydrolysate, zein, pyridoxine or B-complex were reported as causes of anaemia.

Sickle Cell Anaemia.—Many new investigations were made of patients with sickle cell anaemia. The abdominal crises were found to be associated with packing of the small capillaries with red blood cells, stagnation, haemolysis and anoxaemia. The flooding of the liver with products of haemolysis probably accounted for the higher rate of cholelithiasis in these patients than normal. In Central America sicklaemia appeared in 9.6% of the individuals examined in the Canal Zone; 9.6% among the British West Indians and 11.2% of the Panamanians. While the sickling phenomenon appeared in 5%—6% of American Negroes, it appeared in 15.5% of the fit and 25% of sick natives of West Africa.

Sickle red blood cells were about twice as permeable to potassium ions than normal, and the sedimentation rate was slower than normal. A characteristic habitus of the patients was described. High concentrations of inspired oxygen depressed erythrocytogenesis but there was no consistent detectable change in haemolysis. Sicklaemia was described in white persons and in one white youth it simulated an acute surgical condition. Severe joint pains, without residual damage characterized some cases.

The increase in the haematocril reading above 20 mm. per hour following treatment of sickle cell anaemic blood with carbon dioxide was of diagnostic value. (Normal blood, less than 20 mm.)

Preservation of Blood for Transfusion.-The problem of preservation of blood for transfusion ("blood banks") received much attention. In stored blood, the leukocytes and platelets disintegrated rapidly, and there was a loss in the prothrombin content. For anaemia, red blood cells stored in the cold up to 18 days were but little inferior to fresh blood, and such cells could be detected in the circulation for from 70 to 90 days. Placental and cadaver blood was also used successfully for blood transfusion. Reactions from stored blood were not more numerous than from fresh blood. Blood corpuscles injected intraperitoneally, enter the general circulation, and therefore must be of a compatible type in order to be therapeutically valuable. "Universal blood" (group O cells) was made safe for transfusions by the addition of group specific substances A and B. Group O cells, suspended in pooled plasma, reduced the number of reactions.

There was a transitory increase in serum bilirubin after transfusion of stored blood not noted when fresh blood was used. Blood transfusions were given directly into the marrow and the cells entered the circulation just as in transfusions given intravenously.

The use of concentrated red blood cell suspensions for transfusion in anaemia came into general use. A rise of approximately 1 gram of haemoglobin per 100 c.c. followed the infusion of each 300 c.c. of erythrocyte suspension, and the risk of a reaction from transfused isoagglutinins was minimized.

Donors of blood for transfusion regenerated their blood

eight times more rapidly when they took iron medication than when the regeneration was allowed to continue spontaneously. The iron of white bread was found to be available for haemoglobin regeneration, but not that of brown (wheat meal) bread. However, after the introduction of national wheat meal flour in England, the average haemoglobin levels of school children and pregnant women were higher than in preceding years. In the treatment of dogs with anaemia of chronic haemorrhage, it was found that human liver was 20% to 60% more effective than animal liver. Liver and liver extract had value as accessories in haemoglobin regeneration after venesection in dogs.

In acute haemorrhage in man there were no symptoms until the patient sat up or stood up. Syncopal attacks were accompanied by bradycardia. Fainting was the result of neurogenic vasodilation in the muscles.

The anaemia of scurvy was found to be caused by generalized depression of erythropoiesis rather than a failure of maturation from a specific lack of vitamin C. In hiatal hernia, 66% of those affected showed some degree of hypochromic anaemia of haemorrhage, occasionally, however, of the pernicious anaemia type. Dimorphic anaemia, a combination of deficiency of iron with a nutritional macrocytic anaemia, was described in Uganda. A new type of severe hereditary anaemia of boys, transmitted through unaffected females, was also described.

Although most of the patients with anaemia fell into one of two groups, those responding to iron and those responding to liver, folic acid or desiccated stomach, there were some who did not improve. These were grouped under the term "refractory anaemias," and blood transfusion was the only treatment of symptomatic value. Aplastic types of anaemia were described after the ingestion of aspirin, after antisyphilitic treatment and after sulfathiazole. Some patients with aplastic types of peripheral blood showed bone marrow quite rich in cellular elements, whereas others showed hypoplasia or aplasia of the marrow cells. No adequate explanation of this paradoxical observation was formulated.

The concept of a "terraine morbide" in the development of anaemia was supported by numerous observations—the pernicious anaemia familial type, congenital haemolytic anaemias, development of anaemias of various types in different members of the same family, the varying reactions of different people to the same stimulus, as benzene, radioactive substances, drugs, or dietary deficiencies. The patients who succumbed to the different elements in their environment attracted the attention of observers, but inadequate studies were made of those who, in similar circumstances, did not develop anaemia.

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Anaesthesiology

"Anaesthesiology" is a word coined about 1940 to include the practices involved in preparing patients for anaesthesia and their care during and after receiving any anaesthetic. During the decade 1937-46, anaesthesiology

reached full stature as a specialty in medicine, and organizations of anaesthesiologists were perfected.

New Anaesthetic Substances.-Many new ethers were prepared and used experimentally. Among these were cyclopropyl methyl, cyclopropyl ethyl, n-methyl propyl, ethyl n-propyl, propenyl ethyl, propethylene, cyprome, cypreth, cyprethylene and cyclopropyl vinyl ethers. Some of these were given clinical trial, but none had yet established a firm position in clinical use by the end of the decade. Trichlorethylene (trilene), which had been used in inhalation anaesthesia, was found less toxic to the heart than chloroform but not always capable of producing complete muscular relaxation. It was used in obstetrics. Investigators found that toxic products formed by interaction of this product with soda lime in a closed circuit might produce palsies of some of the cranial nerves. This agent might also break down into toxic products under the influence of heat, such as the electric cautery. Used in safe concentration for anaesthesia for short periods, the hazard of toxicity was found minimal.

New Techniques.—Continuous caudal anaesthesia was developed in 1942. Breakage of needles caused trouble at first, but the use of an indwelling catheter which was suggested later reduced this difficulty. Proper selection of cases, and care and skill in carrying out the procedure determined the success or failure of this method of anaesthesia. Its greatest use was in obstetric anaesthesia, but it was found to be useful also in certain surgical cases and for therapeutic uses.

Continuous spinal anaesthesia was first used in 1939. This outstanding contribution made it possible to utilize the safer agents for spinal anaesthesia and still assure the surgeon of sufficiently long-lasting effects. At first a malleable needle was left in the subarachnoid space, and intermittent injections of the anaesthetic agent were made. In 1944, the introduction of a catheter instead of the needle simplified the technique and eliminated the need for a specially designed mattress which had been necessary when a needle was used.

Equipment.—New devices for carbon dioxide absorption, for intravenous administration of drugs, for inhalation anaesthesia as well as for special methods were developed.

The Horton intercoupler was introduced for the purpose of reducing static electricity which might cause explosions in the gas machine.

The intratracheal method of anaesthesia became increasingly useful. Development of plastic type of tubes did not meet with full success. Attachments for, and modification of, tubes added to the applicability of this valuable method of administration.

Intravenous anaesthesia, particularly with pentothal sodium, was used extensively by civilian and military anaesthetists. Pentothal may be used for persons in shock if the dose employed is small in contrast to the dose for a robust patient. Evipal soluble, eunarcon, avertin fluid, as well as other drugs were used for intravenous anaesthesia in a fewer number of patients than pentothal. Later, procaine was given intravenously to produce anaesthesia.

Anaesthetic Adjuvants.—Curare, which is not an anaesthetic, was first used in 1942 to increase relaxation of the skeletal muscles in patients under general anaesthesia. Its initial success continued. It was given intravenously with the inhalation anaesthetics cyclopropane, nitrous oxide, ethylene and ether. With ether the dose must be decreased. It also was used in pentothal sodium intravenous anaesthesia, but a mixture of too much of the drugs in a syringe

or needle forms a precipitate. Respiratory depression or alrest occurs from overdose of curare or from too rapid injection. Drugs with curarelike action were studied. Among these were salts of erythroidine, nicotine, thiamin, magnesium, quinine, quinine ethochloride, other quinine derivatives and ammonium salts. Artificial respiration until respiratory depression is overcome and prostigmine are the antidotes to over-effects of curare.

Bronchoscopy was developed into an important adjunct to successful anaesthesia. Operative and postoperative tracheobronchial aspiration reduced the incidence of serious pulmonary complications.

Helium was used with anaesthetics in situations in which respiration may have been obstructed, when it was necessary to anaesthetize a patient during an asthmatic attack or when an asthmatic attack developed while the patient was being anaesthetized.

Intra-osseous (intramedullar) administration of shortacting barbiturates as well as blood and blood substitutes was introduced for use in special, difficult situations.

Hypnotism found a limited usefulness in obstetrics, therapeutics and surgery.

Oxygen for postanaesthetic use proved valuable, and many devices were made for its administration.

Penicillin was added to anaesthetic solutions in an attempt to increase the usefulness of local anaesthesia, especially in infected regions which previously had been avoided. Studies were made which showed that procaine did not interfere with the activity of penicillin.

Sulfonamides were studied in relation to local anaesthetic agents, inhalation agents and the barbiturates. Procaine was found to have antisulfonamide action. Acetylation of the amino group of p-aminobenzoic acid leads to a 10,000-fold decrease in the antisulfonamide activity of procaine. Studies of anaesthetic agents used for patients treated with sulfonamides indicated that inhalation anaesthesia, being the most controllable type of administration. was preferred to less controllable methods. Sulfanilamide in large doses was found to affect the toxicity of pentothal sodium in rats. No ill-effects, however, were demonstrated among patients heavily medicated with sulfonamides and anaesthetized with pentothal sodium, and no synergism between the two drugs was seen. It was found, too, that sulfonamides did not increase the risk of shock to the animal and in some instances seemed to be beneficial.

The relation of vitamins to anaesthesia was studied as well as the effect of the vitamin state in the preanaesthetic and postanaesthetic periods. Vitamin C deficiency was found to increase anaesthetic induction time and recovery time, and vitamin B_2 was found necessary to adequate functioning of the cell respiratory mechanism.

Analgesics and Sedatives.—Barbiturates continued to appear in increasing numbers during the decade. Vinbarbital sodium was found to be an effective hypnotic and sedative when used in a wide variety of disease states. Seconal was used with good effect for a variety of conditions.

Demerol (1-methyl 4-phenyl piperidine 4-carboxylic acid ethyl ester hydrochloride) was synthesized in 1939. It is an analgesic with atropinelike properties and morphinelike effect on the central nervous system. It has spasmolytic and sedative effects. It was used for preanaesthetic medication and extensively in obstetrics.

Improvements in Anaesthetics.—Cyclopropane continued to be used increasingly during the ten years. Devices to increase its safety as well as special precautions against explosions and improvements in carbon dioxide absorbers decreased the disadvantages of this valuable agent.

Diethyl ether continued to hold its dominant place



Demonstration by U.S. medical officer of proper method of administering spinal anaesthesia, at the Titon General hospital in Fort Dix, N.J. Continuous spinal anaesthesia, first introduced in 1939, was one of the most important new anaesthetic techniques made available to surgeons during the decade 1937–46

among the inhalation anaesthetics as it completed its first 100 years as a surgical anaesthetic.

Divinyl ether also continued to give satisfaction for certain operations. Its usefulness, however, was limited by the ill-effects which occur after prolonged administration.

Nitrous oxide, which in 1942 had been used as a surgical anaesthetic for 100 years, continued to be used extensively, but the anaesthetist became increasingly aware of the need for precautions against suboxygenation with the subsequent danger of cerebral damage. Its greatest use was for induction of anaesthesia and in combination with other agents.

The explosion hazard in anaesthesia was studied, and safety measures were recommended and accepted. With this acceptance came a renewed confidence in cyclopropane and ethylene; previously their use had been limited or discontinued because of the danger of explosion.

The use of local anaesthesia was limited largely by the ability of the anaesthetist and the time required for its application. The intravenous route of administration of morphine increased its usefulness.

Refrigeration as a form of anaesthesia of the extremities was developed, and though limited to a relatively small group of cases, was found of value in prevention of shock, especially in diabetic surgery. Skin grafts were removed painlessly after refrigeration of the donor area.

Shock, its relation to anaesthesia and its treatment when it developed during anaesthesia, was also studied. Supportive measures were used increasingly and with successful results. Treatment of shock in persons wounded in battle decreased the casualties. Blood transfusion, plasma transfusion and blood substitutes were used more as a preventive therapy, thus reducing the incidence of operative shock.

Geriatrics, developed into a specialty, was of interest to anaesthetists who had followed already established principles in applying knowledge of anaesthesia to the increasing number of patients who require surgery in the later years of life. (See also Surgery.)

BIBLIOGRAPHY.—Several new journals began publication during the decade. Volume I of Anesthesia Abstracts appeared in 1937, Revista argentina de anestesia y analgesia in 1939 and in July 1940 Anesthesiology was first published. In 1945, Journal of the American Association of Nurse Anesthetists appeared; it had been issued previously as a bulletin. These journals increased to nine the total number of journals dealing with anaesthesia.

(J. S. L.)

Analysis, Mathematical See Mathematics.

Ancient Monuments, British

The decade 1937-46 in Britain saw an increasing interest in the care of ancient monuments, and an extension of the activities of those bodies, public and private, concerned with their recording, preservation and ownership. The royal commission on historical monuments (England) was appointed in 1908 "to make an inventory of the ancient and historical monuments and constructions connected with or illustrative of the contemporary culture, civilization and conditions of life of the people of England . . . and to specify those which seem most worthy of preservation." The commission proceeded county by county, and published 19 fully documented and sumptu ously illustrated inventories covering nine counties. The royal commission on ancient monuments (Scotland) and the royal commission on ancient and historic monuments for Wales and Monmouthshire were appointed in the same year and produced similar inventories; Northern Ireland had no commission, but the Ancient Monuments Advisory council for Northern Ireland, established in 1934 with the support of the finance ministry and subscribers, issued a single volume on the same lines as the commission inventories,

Early in the air attack on Britain during World War II, urgent need was felt for as complete a record as could be made of outstanding buildings, both ecclesiastical and domestic, of all periods, lest any of them should be destroyed unrecorded. Following a meeting convened by the Royal Institute of British Architects in 1941, the National Buildings record was established, with the support of the treasury, and financial assistance from the Pilgrim and Leverhulme trusts, and the Rockefeller foundation. Working in close collaboration with the royal commissions, this central depository had by 1946 built up a collection of some 300,000 photographs and architectural drawings. The archaeology department of the ordnance survey was concerned with marking finds, ancient sites and monuments on the O.S. maps, and with collecting records, air-photographs, etc., relating to them. The ordnance survey from time to time published period maps.

These bodies, however, were concerned solely with the recording of ancient monuments and had no power to ensure their preservation. These powers were exercised by the ministry of works under the Ancient Monuments acts of 1913 and 1931. Upwards of 350 ancient camps, barrows, castles, abbeys, etc., were in the guardianship of the state under these acts in 1946. The excellent preservation that had been carried out by the ancient monuments department of the ministry of works was widely known and appreciated. Temporary protection was afforded to a far greater number of monuments by a system of scheduling, for no scheduled monuments might be materially altered without the knowledge of the department. Over 5,000 monuments were provisionally protected in this way. Furthermore, the act of 1931 empowered the department to undertake excavations on threatened sites not under its guardianship. Good use was made of this during the war and the period of rearmament that preceded it, when the building of factories and airfields for military purposes entailed the destruction by service departments of many lesser monuments such as earthworks and prehistoric burial mounds.

As a result of this emergency excavation, carried out by experts often under trying conditions, more than 100 burial mounds and many other important sites were scientifically examined before destruction, and no major monument was lost without adequate record. The department was also called upon, with the ready collaboration of the ministry of home security, the Royal Institute of British Architects and of many local architects, to render first aid to many historic buildings seriously damaged by German air raids, at a time when no other body was equipped to deal with the emergency. By prompt action such as shoring or protection from exposure, many ancient buildings were saved from collapse.

The Society of Antiquaries, founded in 1707, had always been vigilant in the care of ancient monuments, and had taken a prominent part in the excavation of such historic sites as the prehistoric hill-fort of Maiden castle, Dorchester, the Roman fort at Richborough, and the Roman cities of Verulamium (near St. Albans) and Camulodunum (Colchester). During the war, the need was felt for a national body to focus archaeological opinion in view of the tasks imposed by war damage to such ancient sites as London, Exeter and Canterbury, and the changes inevitable in the period of development and reconstruction after the war. The Council for British Archaeology was formed in 1943 to meet this need. On it were represented national and local archaeological societies, learned soci-

eties, universities and museums. It was concerned with the co-ordination of research and the expression of informed archaeological opinion on such subjects as aerial survey and the threat to ancient monuments.

Excavations had been carried out at Canterbury and Exeter by local committees in advance of rebuilding, and in 1946 the Roman and Mediaeval London Excavation council was set up under the presidency of the lord mayor to explore the 100 ac. that lay waste within the walls of London before they were again built over. Apart from national bodies, numerous county archaeological societies had ancient monuments committees which were vigilant in their own districts, and many published lists of scheduled monuments in their areas. The National Trust (q.v.) owned more than 100 ancient monuments, in particular inhabited houses, which lay outside the scope of the ministry of works. It acquired the famous prehistoric site of Avebury.

The care of cathedrals and churches was primarily the concern of the diocesan authorities, but a movement that had gained impetus and usefulness was the formation of societies of friends of cathedrals like Canterbury, York and Dunblane, who collected funds for the repair and adornment of the fabric. Similar bodies were formed for the care of other places, e.g., Abingdon, where the friends (1946) had undertaken the preservation of the remains of Abingdon abbey.

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Anderson, Clinton Presba

Anderson (1895-), U.S. government official, was born Oct. 23, 1895, in Centerville, S.D. After attending Dakota Wesleyan university, Mitchell, S.D., and the University of Michigan, Ann Arbor, Mich., he went to New Mexico and worked in journalism and later as an insurance salesman in Albuquerque. In 1935, Anderson was placed in charge of the state's relief administration, and he was chairman of the New Mexico Unemployment Compensation commission (1936-38). In 1940, he was elected on the Democratic ticket to the U.S. house of representatives and was twice re-elected. Anderson voted against the Roosevelt administration on several domestic issues but approved generally the government's foreign policy. On May 23, 1945, President Harry S. Truman appointed Anderson secretary of agriculture, and the following month the War Food administration was transferred to Anderson's control.

At the height of the world famine in early 1946, he was opposed to U.S. food rationing and declared that such measures would prove impractical. Anderson also was at odds with Chester Bowles and Paul Porter on removal of price controls. Congress solved this dispute in Anderson's favour by stipulating in the new price control act of July 26, 1946, that the secretary should not be subject "to the direction or control of any other appointive officer

or agency in the executive branch of the government." This gave Anderson authority to act independently of other government agencies.

Anderson, Sir John

Sir John Anderson (1882-), British statesman, was born July 8, 1882, in Scotland; educated at Edinburgh and Leipzig universities, he entered the British colonial office at the age of 23. After World War I, he was dispatched by the government as its official "trouble shooter" to Ireland and Bengal; in both areas he employed strong measures to cope with "unrest." He was permanent under-secretary of state for the home office, 1922-32, and governor of Bengal, 1932-37. After his return to England, he was elected to commons, 1938. That same year he was made lord privy seal and minister of civilian defense, and was appointed home secretary and minister of home security in 1939.

Sir John was lord president of the council, 1940-43. After the death of Sir Kingsley Wood, Sir John was named chancellor of the exchequer, Sept. 24, 1943. Sir John lost his seat in the cabinet in the general elections in the summer of 1945. However, he was made chairman of the British Advisory Commission on Atomic Energy and accompanied Prime Minister Clement Attlee to Washington in Nov. 1945 for the Truman-Attlee-King joint talks on atomic energy. He expressed the view that it would be "many years" before atomic energy could compete with existing sources of industrial power. Earlier he had warned that the advent of atomic energy made a complete readjustment of international relations and the forming of a new social order mandatory.

Anderson, Sir Kenneth Arthur Noel

Sir Kenneth Anderson (1891–), British army officer, was born Dec. 25, 1891. He was educated at the Royal Military college at Sandhurst and entered the army in 1911 as a second lieutenant in the Seaforth Highlanders. Wounded in World War I, he was awarded the military cross. After the war, he advanced through the grades and was made a major general in 1940. In 1942, Gen. Dwight Eisenhower chose Gen. Anderson as one of his three task-force commanders in French North Africa. Raised to the rank of acting lieutenant general, Anderson led the British 1st army in the combined Allied campaign in North Africa, Nov. 1942 to May 1943. In the early part of that campaign, he attempted a quick dash to seize Tunis and Bizerte before the arrival of axis reinforcements in those strategic ports. However, German panzers and new axis troops, ferried by air transport from Sicily, balked this drive. In July 1943, he was given the permanent rank of lieutenant general. A month later, he was knighted in recognition of his services in the war. On Feb. 13, 1944, he was named head of the eastern command in Great Britain.

Andrews, Elmer Frank

Andrews (1890-), U.S. government official, engineer, industrial adviser and labour consultant, was born Nov. 22, 1890, in New York city. He studied at Rensselaer Polytechnic institute, graduating as a civil engineer in 1915. He supervised construction of sugar warehouses and railways in Cuba, was associated for a brief period with the compensation insurance rating board of New York state and served as a lieutenant in the U.S. air force in World War I. After the war, he worked with several railways and the Queensboro Chamber of Commerce, where he was in charge of highway and bridge

construction.

Andrews, who became industrial commissioner of the state of New York in 1933, also served as adviser to the National Labor Relations board in mining districts and in 1934 was made head of the U.S. observers at the International Labour organization conference in Geneva. In 1938 he was named by President Franklin D. Roosevelt as administrator of the Fair Labor Standards act. He left this post the following year and subsequently became a consultant on labour relations.

Andrews, Frank Maxwell

Andrews (1884-1943), U.S. army officer, was born Feb. 3, 1884, in Nashville, Tenn. He was graduated from West Point in 1906, became a cavalry lieutenant and was promoted through the grades to colonel in 1935. Gen. Andrews saw service in the Philippines, 1906-07, and in Hawaii, 1911-13. During World War I he served as a major in the signal corps and from 1920 to 1923 served with the army of occupation in Germany. He was appointed temporary major general of the air corps in 1935 and commanded G.H.Q. air force from 1936 to 1939. While in the latter post, Andrews piloted an army air corps amphibian bomber 1,425 mi. from San Juan, Puerto Rico, to Langley field, Va., setting a new world's distance and straight-line record for amphibian planes. In Sept. 1941 he was promoted to the rank of lieutenant general and was appointed head of the Caribbean defense command and the Panama canal department. On Nov. 4, 1942, Gen. Andrews was given command of all U.S. forces operating with the British in the middle east zone. On Feb. 5, 1943, he was named to succeed Gen. Eisenhower as commander of all U.S. forces in the European theatre of operations. He was killed when a U.S. bomber in which he was a passenger crashed in Iceland, May 3, 1943.

Anglican Communion

The Anglican communion is that body of Christians, in the British empire and elsewhere, who are in full communion with the archbishop of Canterbury. At the end of the decade 1937–46, it contained 320 dioceses and perhaps 9,000,000 communicants.

Although World War II postponed the seventh Lambeth conference from 1940 to 1948, a focused impression of the Anglican communion may be gained from the wider setting of the third World Missionary conference at Madras, India, in Dec. 1938, where all the leading churches (except Rome) of some 70 different countries were represented. Four features prominent at Madras were developed by the ensuing six years of war: (1) the growth of indigenous leadership: 145 delegates from the younger (missionary) churches formed more than half the membership at Madras, a significant contrast with Edinburgh, Scotland (1910); (2) the rise of church consciousness: the church itself, rather than any missionary agency within it, was recognized as the ordained instrument of evangelism, although the value of missionary societies to engender and express evangelistic activity was acknowledged; (3) the progress of oecumenical co-operation, hailed by Archbishop William Temple as "the great new fact of our era"; (4) the discovery of the extreme importance of the Anglican communion in contemporary Christendom; this had already transpired at the two great oecumenical conferences of 1937, at Oxford ("Church, Community and State") and Edinburgh ("Faith and Order"), which culminated the following year in the formation of the World Council of

churches. English, thenceforth, became the common language of occumenical Christianity.

United States.—The Protestant Episcopal Church (q.v.) of the United States of America came to realize its membership in the Anglican communion more fully. Thus, during the war, gifts from the Episcopal Church of America to Anglican missionary societies totalled \$570,000; exchange visits of English and U.S. bishops were arranged; and joint spheres of work were replanned in the West Indies, such as the appointment in 1942 of a U.S. bishop to the English diocese of Nassau, and the agreement to transfer the Central American republics from the English diocese of British Honduras to the American diocese of the Panama Canal Zone.

These years were for the Episcopal Church "an encouraging decade." Though its communicant membership did not number more than 1,500,000 of the United States's 132,000,000, its comprehensive character had a wide appeal. When immigration ceased with the war, communicants increased at double the rate of the population.

Three movements, manifest throughout the Anglican communion, assumed a characteristically active form in the United States. The liturgical movement, born of a deepened church consciousness, focused attention on tradition and ritual. The orthodox movement back to biblical theology flamed, as in England, into an urge for evangelism. The oecumenical movement gave rise to a commission on approaches to unity, with the Presbyterian Church specially in mind.

British Commonwealth.—The Church of England in Canada exchanged, in 1939, the hardships of a nine years' drought for the even graver dislocations of war, which claimed as service chaplains no fewer than one-eighth of the 1,630 clergy on its active list. Although missionary work among Indians suffered thereby, and church returns of every kind showed a decline, the three movements, so notable in the United States, were pre-eminently active in Canada. In 1945 a committee was appointed to consider prayer book revision. The general synod, in 1946, unanimously commended for study proposals for reunion between the Church of England in Canada and the United Church of Canada (formed in 1925).

The church in Australia and Tasmania accounted the years 1937–46 some of the most formative in its history. The people were made serious by the threat of invasion. Church life was quickened by the advent of U.S. chaplains and exchange visits between religious leaders of the two countries. The eyes of fighting men were opened to the triumphs of the gospel in the Pacific islands: more particularly in the dependency of New Guinea, where eight missionaries were killed at their posts by the Japanese.

There arose an all-embracing urge for evangelism. "Religion and Life" weeks were organized on a united front, and important steps were taken to claim for the church the leadership of men and women returning from war service. "Bush" church agencies reinforced their activities. A newly formed National Missionary council planned, with a similar body in New Zealand, a postwar conference to strengthen and co-ordinate missionary work in the Pacific.

The province of New Zealand (which included the two missionary dioceses of Melanesia and Polynesia) exhibited the same trends and joined in the formation of a national council of churches, which organized in 1945 a conference on "Christian social order."

The province of South Africa, confronted with widespread materialism and an acute "colour" problem, became conscious of a new spirit in the union, that began to regard its pattern of black and white no longer as antagonistic but co-operative. Evangelistic campaigns organized by the Christian council of South Africa, the splendid conduct of African troops and the discovery of the intellectual and artistic capacity of native children in missionary schools all contributed towards the new outlook.

The missionary churches of Africa presented a marked contrast between mass movements towards Christianity by pagan peoples in central and east Africa, and "holding the fort" in Moslem areas in the north and west. African Christians proved themselves the best missionaries to their fellows, as also leaders among African troops. The future seemed largely to depend on the use made by the churches of those returning from the development and discipline of war service, and their resettlement in the backward life of their home community. A disturbing feature was the extraordinary growth of native Christian "mush100m" sects. In South Africa alone, these increased from 75 in 1918 to nearly 800 in 1945. The situation called for the authority of a strong, co-ordinated church, giving urgency to proposals for the formation of new Anglican provinces both of west and east Africa, and also to the movement towards that larger unity already taking shape in south India, which was watched with eager eyes by missionary churches all over the world.

The younger missionary churches, cut off from western assistance, or in axis occupation, emerged from the war with a new-gained maturity that promised impressive advance and increased influence, despite many local disasters, more particularly in Manchuria. Indigenous church leadership developed, both with the rise of national consciousness and through the self-dependence imposed on native clergy and congregations by war conditions. Church consciousness developed through the intermixture of peoples and their common sufferings and experiences. To the pressure of heathenism, more particularly in Moslem countries, was now added this larger church consciousness which overrode accidental loyalties to western denominationalism. The war revealed the younger churches to servicemen of the older churches, and to the pagan peoples around them, as well as to themselves.

The church of India, Burma and Ceylon markedly demonstrated these features. The magnificent way in which the Church of England had transformed its missionary stations into an autonomous and independent church went far to remove the danger of the expulsion of British missionaries when India should assume self-government. Church consciousness was thus enabled to keep pace with national consciousness and exert a Christian influence on Indian politics; this was exemplified by the inclusion of a Syrian Christian, Dr. John Matthai, as minister of finance in Lord Archibald Wavell's provisional government in 1946. The strength of the church was shown by the consistency of Indian Christians in war service; they returned with a wider outlook and disciplined character that qualified them for Christian leadership of a high order. The scheme for a united church of south India (which included four Anglican dioceses) progressed towards fulfilment despite the organized opposition of extremists in England, and was accepted in 1946 by all three of the negotiating church bodies. As over 95% of those affected by the proposal would be Indians, the question for the Anglican communion as a whole was its attitude towards the united church during an interim period of 30 years, before full communion would be achieved. This would be the concern of the Lambeth conference of 1948.

The Burmese diocese of Rangoon afforded a war record

typical of most missionary churches under the heel of the Japanese, and more particularly of its neighbouring diocese of Singapore, where the whole Christian community combined to maintain the life of the church when its heroic bishop was interned and tortured. Three native priests who had kept the church alive despite persecution, threats and torture were appointed archdeacons with the return of peace. Buddhists no longer regarded Christianity as an alien system but as exhibiting an enviable quality of life among themselves. British and U.S. forces made it their business to assist in refitting churches after their desecration by Japanese.

Far East.—The Holy Catholic Church in China (Chung Hua Sheng Kung Hui) suffered inevitable devastation and dislocation from eight years of Japanese invasion (1937–45). Its vitality, however, was apparent in national leadership, missionary activity and the organization of relief services. Although Chinese Christians (of all denominations) numbered only 7 in every 1,000 of the population, yet in a Who's Who, published during the war, 1 name in 6 was that of a Christian, and 1 in 3 had received a Christian education.

Although 10 of China's 13 dioceses were occupied by the invader, the church still maintained its missionary work in the Shensi diocese among the border peoples of Mongolia, Turkestan and Tibet. Although congregations were scattered, their members became missionaries in other regions. Moreover, the leading part played by the church in educational and Red Cross work was itself evangelistic. The Church of England accounted it a privilege to hand to Bishop T. K. Shen, in June 1946, the first instalment of a promised gift of \$402,000.

The Japan Holy Catholic Church (Nippon Seikokwai) celebrated in 1937 its jubilee as an independent church, though the Church of England still provided seven of its ten bishops and about half its income. In 1940, rising national feeling dictated the advisability of the withdrawal of foreign missionaries and support. This, however, did not prevent the Japanese government from recognizing only two Christian bodies, the Roman Catholic Church and a "Japan Christian Church" comprising all other denominations. About one-third of the Nippon Seikokwai joined, in 1942, this united Protestant church, and the three seceding bishops consecrated seven more. Two-thirds of the church stood firm despite threats, imprisonment and the loss of corporate existence.

In 1946 an Anglican commission visited Japan. It found the church bankrupt and with most of its property destroyed by bombing, but conscious of a strengthened faith. The visit provided the occasion for an approach towards the healing of the division, and for an appeal to the older churches to rally to a great opportunity for advance. The extent of the opportunity could be gauged by the general testimony of internees and prisoners of war in the far east, that they experienced humane treatment wherever the Japanese in authority were Christians. (See also Church of England.)

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Angling

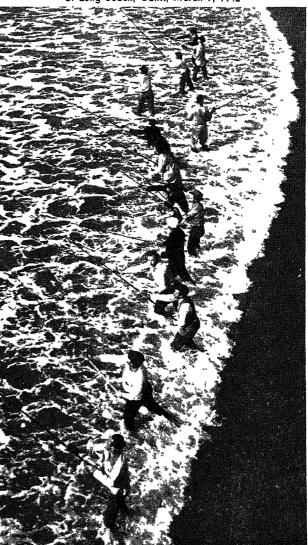
Perhaps the best-way to evaluate the increase in popularity of angling during the decade 1937–46 was on the basis of angling licence sales in the United States. They showed a gradual increase from 1937 through 1945 from 6,197,240 to 8,280,232. (Sales on the basis of the fiscal year ending June 30.) Figures for the years 1938 to 1944 were

as follows: 1938, 6,643,195; 1939, 6,890,130, 1940, 7,858,275; 1941, 8,004,034; 1942, 8,423,218; 1943, 8,028,674; 1944, 7,846,168.

Licence sales alone, however, were only an indication of the general trend in sport fishing. In many states, resident women were still not required to have licences; all states allowed children to fish without them, and nowhere was a licence required for salt-water fishing. The actual number of anglers, then, remained much larger than the number of licences held.

In salt-water sport fishing, perhaps the most significant development during the period was the formation of the International Game Fish association in June 1939 and its rapid growth after that date. It was established to serve the interests of anglers and to add to the general knowledge concerning fish. It concerned itself with anything relating to ocean fish and fishing, both from the standpoint of the sportsman and the scientist, and served as a clearinghouse for the exchange of information between anglers and ichthyologists. Its headquarters were established in the American Museum of Natural History, in New York city, with which it became officially connected Despite the difficulties of expansion during the war.

Practising for the U.S. All-Western Surf Casting tournament held at Long Beach, Calif., March 7, 1942



Salt Water	Weight	Length	Girth	Angler	Place	Date
Amberjack	106 lb.	5'81/2"	37"	H. M. Harker	Passagrille, Fla.	3/21/37
California white sea bass	741/3 lb.	6'4"	30"	W. M. Hartness	Playa del Rey, Calif.	3/8/41
Channel bass		643/4"	41"	B. R. Ballance	Cape Hatteras, N.C.	11/29/41
Blackfish or tautog		30"	211/4"	A, von Kleist	Sheepshead bay, N.Y.	11/30/37
Cobia	102 lb.	70"	34"	J. E. Stansbury	Cape Charles, Va.	7/3/38
Dolphin		681/2"	371/2"	Fred McNamarra	Wajanae, Oahu, T.H.	8/19/40
Blue marlin	737 lb.	13/1"	72"	J. V. Martin	Bimini, Bahamas Isls.	7/16/41
White marlin	161 lb.	8'8"	33 "	L. F. Hooper	Miami, Fla.	3/20/38
Pacific sailfish	190 lb.	10'21/2"	39"	E. Tremayne	Charles is., Galapagos	2/8/38
Sawfish	736 lb.	147"		G. Pangarakis	Galveston, Tex.	9/4/38
Mako shark	1.000 lb.	12'		B. D. H. Ross	Mayor Is., New Zealand	3/14/43
White shark		14'8"	8′1/2 "	C. R. Cowell	Kangaroo Is., Australia	5/12/41
Thresher shark	922 lb.			W. W. Dowding	Bay of Islands, N.Z.	3/21/37
Tiger shark	1,382 lb.	13'10"	7′9″	L. Bagnard	Sidney Heads, Australia	2/22/39
Snook or robalo	501/2 lb.	55"		J. W. Anderson	Gatun spillway, C.Z.	1/2/44
Swordfish	860 lb.	13'9"	5′10″	W. E. S. Tuker	Tocopilla, Chile	4/28/40
Tarpon	247 lb.	7'51/2"		H. W. Sedgwick	Panuco River, Mexico	3/24/38
Allison tung	265 lb.	73"	53 "	J. W. Harvey	Makua, T.H.	7/31/37
Bluefin tung	927 lb.	10'3 "3	6'8"	J. Vernaglia	lpswich bay, Mass.	8/25/40
Wahoo	133½ lb.	611"	31"	K. L. Ames, Jr.	Green Cay, Bahamas Isls.	4/24/43
Weakfish	171/2 lb.	46"	19"	A. Weisbecker, Jr.	Mullica river, N.J.	9/30/44
Spotted weakfish	14 lb.	331/2"	18"	R. N. Rose	Lake Worth, Fla.	2/9/46
Yellowtail	88 lb.	5'4"	27"	Clive Firth	Bermagui, Australia	4/23/38
Records compiled by the Intern	ational Game	Fish assoc	iation			

Fresh Water	Weight	Length	Girth	Angler	Place	Date
Muskalonge	46½ lb. 22¼ lb.	56½" 52½" 36¼" 37½"	29¼ " 25" 21" 30¼ "	Percy P. Haver Peter Dubuc Patrick E. Noon Laurence Hamilton	Lake St. Clair, Mich. Sacandaga Res., N.Y. Fort Erie, Ontario Pend d'Orielle lake, Ida.	6/20/40 9/15/40 5/26/43 7/15/45
December and with 1 to Et al. 1 0 C	**************************************					

Records compiled by Field & Stream.

Castina Records-1937-46

	Cashing Records—1737—40
5/8-oz. Distance Bait	Average 4071/3 ft., Ernest Liotta, Jr., at Indianapolis, Ind., 1946 Long cast 417 ft., Lee Sens at San Francisco, Calif., 1939
3/8-oz. Distance Bait	Average 359% ft., Clarence Anthes at Chicago, III., 1942 Long cast 385 ft., Clarence Anthes at Chicago, III. 1942
Trout Fly Distance	Average 17634 ft., Dick Miller at Buffalo, N.Y., 1937 Long cast 183 ft., Dick Miller at Buffalo, N.Y., 1937
Salmon Fly Distance	Average 1861/3 ft., Robert Piros, St., at St. Louis, Mo., 1944 Long cast 197 ft., Dick Miller at Indianapolis, Ind., 1946
All Distance Record	3,243 feet, Dick Miller at Chicago, Ill., 1943
5/8-oz. Accuracy Baif	100, J. A. Halbleib, at Indianapolis, Ind., 1946
3/8-oz. Accuracy Bait	99, S. G. Dennis, at Detroit, Mich., 1945
•	Mrs. Harry McDonald, at St. Louis, Mo., 1944
Dry Fly Accuracy	100, Frank Steel, at Pittsburgh, Pa., 1932
	(During the decade 1937-46 the best score was 99, made by Jimmie Price in St. Louis, Mo., 1941; Harold Smedley in St. Louis, 1944; and Henry Fujita in Indianapolis, Ind., 1946.
Wet Fly Accuracy	100: this record was set in 1931 and has since been tied by 14 casters.
All Accuracy Record	389, Earl Osten, at St. Louis, Mo., 1944 Charles Sutphin, at Indianapolis, Ind., 1946
Surf	705 ft. 4 in., 4-oz. lead, August "Premo" Livenois, Jr., Aug. 25, 1940, at Monterey, Calif.

Records compiled by the National Association of Angling and Casting clubs.

the I.G.F.A. by the end of the decade had 59 member organizations in 36 sections of the world, including the United States, Africa, Australia, Bahamas Islands, Bermuda, British Isles, Canada, Canal Zone, Costa Rica, Cuba, Fiji Islands, France, Hawaiian Islands, Mexico (northern), Mexico (southern), New Zealand, Newfoundland, Philippine Islands, Puerto Rico, Netherlands West Indies, South America, Belgium, Malaya, Windward Islands, Tahiti, Marianas Islands, Tobago and Trinidad.

The I.G.F.A. was the only recognized body maintaining records in salt-water angling. There was still no comparable organization in fresh-water angling, although the National Association of Angling and Casting clubs continued to hold an annual tournament and to be responsible for records in the tournament casting field-records compiled by Field & Stream magazine.

The N.A.A.C.C. was founded in 1906 and enjoyed a continuous growth-a growth which continued during the decade despite the interruption of World War II. In addition to holding its annual tournament, in which teams and individuals from member clubs in all sections of the United States participated, the organization was responsible for many of the improvements made in fishing tackle. It led the way in standardizing line sizes, leader sizes and hooks and made progress toward the acceptance of a recognized fishing terminology.

A number of improvements in fishing tackle were made during the period. The one which had the greatest effect on angling generally was the development of nylon

by the E. I. du Pont de Nemours and company in 1939. Nylon was placed on the market both in monofilament form, used chiefly for leaders, and in braided lines. This new product had a strong impact on the fishing tackle business. Previously, there had been no serious competitor for braided silk lines or for silkworm gut leaders. Nylon was both. In addition, since it did not rot in salt water, it was a serious competitor to linen lines.

The I.G.F.A. in 1946 still was evaluating nylon and attempting to arrive at a fair basis for comparison between fish caught on it and linen. From the time of Izaak Walton, silkworm gut had had no serious competitor as a material for leaders. Because of war requirements, nylon was withdrawn from commercial sale, but was made available again in Oct.

Another improvement in fishing tackle was the perfection of a process to impregnate bamboo rods with bakelite, thereby adding considerably to the strength and durability of the ma-

terial. This process was worked out by the Charles F. Orvis company of Manchester, Vt., in 1941. A war development of great benefit to fly fishermen was the silicon resin waterproofing materials. These compounds were adapted to dry-fly oil and line dressing and were far superior to anything previously known.

The general trend in fishing tackle during the decade was toward the use of lighter, more sporting equipment.

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Anglo-Egyptian Sudan

A condominium under the joint sovereignty of Great Britain and Egypt, south of Egypt, the Anglo-Egyptian Sudan has an area 967,500 sq.mi.; pop. (est. 1942) 6,591,000. Chief towns: Khartoum (cap., pop. 1944, including Khartoum North) (76,724); Omdurman (est. 1944) (104,513);

Wad Medani (est. 1942) (41,000); El Obeid (est. 1942) (39,887); Port Sudan (est. 1943) (35,617); Kassala (est. 1941) (30,026). Languages: Arabic, English, various Nilotic and Negro tribal languages and dialects. Religion: Mohammedan; south Sudan is 20% Christian, 80% pagan.

Governors-General during the decade 1937–46: Lt. Colonel Sir Stewart Symes (Jan. 1934–Oct. 15, 1940); Lt. General Sir Hubert Huddleston (after Oct. 16, 1940).

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THE YEAR 1937 was the first year after the reaffirmation by Great Britain and Egypt of the treaty of 1899 by which they agreed to administer the country jointly. The Gezira cotton scheme, one of the most modern large-scale cooperative enterprises in the world, had been in operation for 12 years and was building up to the pre-eminent position which it occupied in the country's economy at the outbreak of World War II, when it was contributing 25% of the whole revenue of the country. One of the difficulties with which the department of agriculture was faced was the ancient system of dividing up crops between a number of co-owners, which had resulted in extreme fragmentation of land. In the years 1937-46, the institution of private co-operative and government pump schemes continued, and its further development was limited only by the Nile Waters agreement which determined the respective shares of Sudan and Egypt in the waters of the Nile.

The Gezira irrigation scheme, started in 1925 as an answer to the problem of levelling an adverse balance of trade and to guarantee a grain supply in case of famine, more than justified during the war the bold planning and foresight of the government and was a solid bastion against famine panic. In 1942, after three poor rains and two years of war, the price for grain in Khartoum rose no higher than £E7 (\$29.67) per short ton, whereas before the start of the scheme in bad years grain had reached the very high price of £E17 (\$71.61) (the average exchange rate for the years 1939-43 being 1£E=\$4.13). Cotton remained far and away the Sudan's best suited crop, and even the primitive natives and pastoral Arabs of the Nuba mountains were persuaded to grow it. Their crops alone for the years 1938-40 were worth more than £E100,000 each year.

From the very first, education had been regarded as of paramount importance. An appeal to the British public two years after Kitchener's defeat of the Mahdi in 1899 led to the foundation of the Gordon Memorial college described by Lord Salisbury as "a great effort to break down the obstacles of race, to establish the bond of intellectual sympathy and to further the pursuit of human culture," and it was no new departure from precedent when in 1937 the government approved new proposals involving capital expenditure of nearly £E500,000 and an increase of annual expenditure of £E150,000 as a result of the findings of the De La Warr commission on education. It was then planned to start post-secondary courses so as to develop eventually a college of university status while the output of teachers for both boys' and girls' schools was to be doubled. World War II delayed the fulfilment of these schemes. Gordon college was taken over by the army and also the first of the new secondary schools when completed at Wadi Seidna. Sudanese staffs were unable to go on post-graduate courses overseas. The schools of law had opened in 1936; two years later the schools of veterinary and agriculture were opened; in 1939 the schools of science and engineering; in 1940 the school of arts. An innovation in 1942 was the opening of two junior secondary schools, while the success of the elementary teachers' training college led to a revision of the intermediate school curriculum. In 1944, the army evacuated Gordon college, and its status was raised to that of a university college.

During the years 1937–46 much progress was seen in overcoming resistance to female education, and in 1945 there were 65 government schools attended by 6,495 pupils in addition to one intermediate school and a teachers' training college. A number of mission and community schools also operated for Sudanese girls. The main difficulty to overcome was the custom of early marriage, which limited a girl's teaching life.

A notable feature of the work of the forestry department was the introduction of the mesquite tree from America. This proved a valuable anti-erosive agent in semi-desert conditions and also provided highly nutritive fodder for cattle and in case of need an edible flour for human beings. The war and consequent demand for timber made feasible the cutting of the tropical softwood podocarpus, which abounded in the mountains on the Sudan's southern border with Uganda, and transporting it to markets in the north.

The Sudan medical service had a widespread and comprehensive organization. In the years 1937–46, the emphasis was changing from curative to preventive treatment. There was hospital accommodation for over 7,000 people at a time and in 1943 100,000 in-patients were treated, while there were nearly 8,000,000 out-patient attendances. The infant mortality rate for Khartoum was, in 1943, 72 to 86 per 1,000, which compared favourably with other tropical cities. There was extensive vaccination against smallpox, and a large-scale campaign against sleeping sickness was successful although a large organization had still to be maintained in the affected area.

Railway traffic had steadily increased because of the effects of the war and general increased prosperity. In 1943, the total tonnage of goods handled was 1,316,398 while the number of passengers carried in the same year was 1,675,304. Permanent all-weather roads were constructed in the south in the years 1937–46 linking the country with Uganda and the Congo. Air transport was beginning to play an increasingly important part in the country's communications, and its development was facilitated by Khartoum's position at the intersection of the main air routes from South Africa to Egypt and from West Africa to Asia.

The main factor contributing to the new wealth of the country was the increase in trade, both internal and external. The veterinary service concentrated on developing an export market for Sudan cattle and sheep by building up a reservoir of good quality stock. They were at last winning in the long fight to obtain the stockbreeders' cooperation in the war on rinderpest and pleuro-pneumonia, but it was more difficult to make them see the need for selective breeding to obviate over-stocking of grazing areas and progressive deterioration of stock and soil. During World War II the country exported cheap meat on a scale which in 1937 would have been thought far beyond its capacity.

The history of the Ethiopian campaign made it quite clear that if the Anglo-Egyptian Sudan had fallen in 1941, Egypt would have been untenable to the British because the supply line to middle east via the Red sea and across Africa from Takoradi to Khartoum would have been severed. But when war was declared by Italy the Sudanese defense force succeeded in bluffing the Italians that they were far stronger than they really were. All forms of munitions were produced in the workshop of the Sudan

railways and public works department while the people of the Sudan gave over £E200,000 to various allied war funds and invested £E747,000 in war savings.

In 1946 the Umma (Sudanese Nationalist, anti-Egyptian, led by Sir Abdel Rahman el Mahdi Pasha) party sent two representatives to Cairo to the Anglo-Egyptian treaty revision conference. Much rioting in Khartoum took place as a result of rumours and statement of Sidky Pasha that the Sudan would be embodied under the Egyptian crown (see Egypt). Gordon college was shut. Three thousand Umma party followers demonstrated in Khartoum in October and presented a petition to the governor calling for independence.

Severe flooding of areas of country around Khartoum and Omdurman occurred in Sept. 1946, when the Blue Nile reached a height of 55.7 ft.—the highest recorded since 1917—and burst its banks.

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	Anglo-Egyptian Sudan.	Statistical Data, 1938	
ltem		Value (000's omitted)	Amount or Number
Exchange rate .		,	£E1 =£1 0s.61/4 $($5.013)$
Government exp	renues	£5,262 (\$25,725) £4,981 (\$24,352) £16,184 (\$79,122)	(4010.0)
Highways	erways (rivers)		1,995 mi. 1,000 mi. 2,714 mi.
Communication Telephones			2,252
			8,866 oz. 41,887 tons
Crops Millet (durra) . Cotton			311,951 tons 200,450 "
Livestock Cattle Sheep Goats			2,700,000 2,500,000 2,000,000
Raw cotton		£5,630 (\$27,523) £3,514 (\$17,180) £679 (\$3,322) £249 (\$1,215)	27,000 tons
Sugar		£6,443 (\$31,499) £1,189 (\$5,814) £655 (\$3,201) £535 (\$2,618)	
Defense Standing army	personnel	,	4,599
Education Government el diate schools Students Gordon Memor State-aided Ko Students Mission schools	lementary and interme- ial college students		148* 17,541* 1,308* 501* 23,000* 12,925*
*1940.			

Angola

See Portuguese Colonial Empire.

Animal Fats

See VEGETABLE OILS AND ANIMAL FATS.

Animal Industry, Bureau of

See Agricultural Research Administration.

Annam

See French Colonial Empire.

Anschluss

See Austria; Germany; Italy.

Antarctic Exploration

See Exploration, Polar.

Anthropology

Few decades since the establishment of anthropology witnessed more ferment, more change, more re-examination of accepted points of view and more exploration of new avenues of study than the period 1937–46. Positions that had previously been only enunciated grew into full vigour. Problems that had been the subject of speculation took on specific statement and were attacked in programs of field research oriented methodologically along new lines. It would be distorting the historical picture and doing an injustice to earlier students to say that anthropology was a different discipline at the end of the decade than at the beginning, yet it remained nonetheless true that it was by no means the same science as in the years preceding 1937.

It was not strange that most of the new currents that characterized anthropology during the period were initiated and developed in the United States and England. Europe knew only two years of peace, and after 1939 European anthropologists had little opportunity for the field study that is the essence of anthropological research. In Germany, during the entire period, nazi theories of race and culture made conventional anthropology difficult, if not impossible to carry on. Except for those who were politically quiescent and restricted their research to the most remote and exotic problems, the only anthropology Germany knew was the prostituted rassenkunde that bolstered the claims of the "master race." That the blight did not later spread into the occupied countries was due to the heroism of those who refused intellectually to surrender to their conquerors. Many paid with their lives, others with their liberty, or sought exile. It was remarkable that the lines of achievement reached at the outset of World War II could be held, and the very substantial studies that began to reach the outer world from France, Belgium, the Netherlands and Denmark when the war ended could be published.

In the U.S., however, half the decade was little touched by war—officially, not at all. When war did strike, though it took many anthropologists from their customary posts, enough remained in the universities and museums not only to carry on a considerable proportion of their usual activities, but also to extend the boundaries of concept and available data along the lines laid down during previous years. In England, also, while most of the available anthropologists went into war service, the exigencies of the colonial service encouraged some study of native peoples, and stressed application of its findings to the problems of native rule.

The gains made by anthropology during this war decade in countries where it had existed previously either in rudimentary form, or as the avocation of amateurs, were particularly striking. Anthropology in Latin America, especially Mexico, Brazil, Peru, Haiti, Colombia and Venezuela, attained a status and commanded trained personnel as never before. In India and China, also, despite the travail these countries experienced, new university posts, new research institutes, and study along new lines characterized their anthropological decade.

Several reasons accounted for the flowering of anthropological science during the period. In all countries, an increasing tendency toward professionalization of the science was manifest. Anthropologists who received training leading to the doctorate steadily increased, both in absolute number and in proportion to those who, in earlier



Native of New Guinea helping U.S. signal corps linesmen string telephone and electric wire during the U.S. campaign in New Guinea. Anthropologists were of prime importance in making such co-operation possible by contributing to the armed forces their knowledge of the languages and customs of native peoples all over the world

times, would have claimed recognition because of the circumstance of their work as colonial officials, or as missionaries, or as travellers. Merely to gather information became insufficient; questions came to be raised more and more insistently about the reasons for gathering data, the nature of the problem being studied, the theoretical frame of reference that guided research.

A second reason for the growth of anthropology was the developing realization that, in a world society, the science that looks at man in the round, so to speak, must have an important contribution in establishing and perpetuating a world order. The cultural relativism taught by anthropology, that stressed the dignity and worth of all ways of life, however they might differ, came increasingly to be recognized as an important and perhaps indispensable philosophical basis for a society that was to include the most diverse types of traditions. At the same time, the work of anthropology in combating racism, another consequence of its stress on the unity of mankind, brought about added recognition of the contribution this science could make to solving the problems of human living.

Finally, anthropologists tended to turn more and more to the study of problems closer at hand than the remote subjects of their earlier interest. Physical anthropologists intensified their investigations of the growth and development of children, or of the formation of population types. Cultural anthropologists began to apply their methods to the study of literate peoples as well as illiterate—"primitive"—folk, to analyze the results of culture-contact as well as to seek out presumably uncontaminated "savage" cultures, to investigate the manner in which different cultures shape the individuality of those who live in accordance with them. Linguists applied their techniques to written as well as unwritten languages, and began to use their techniques in teaching students how to master new and strange tongues. Folklorists came to recognize the vital quality of the songs and stories and other living word-of-mouth literary forms, as well as the survivals of past belief with which they had previously been almost exclusively occupied.

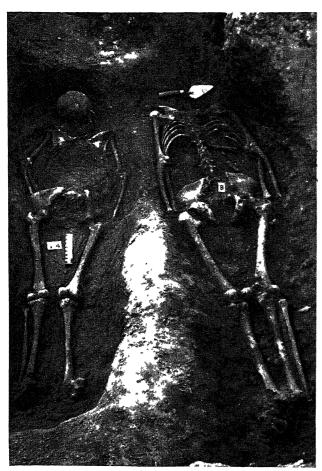
We may now consider in turn the changes that took place in each of the principal divisions of anthropology during this decade, which witnessed the 100th anniversary of the founding of two of its oldest societies, the Royal Anthropological institute of London and the American Ethnological society of New York. Not only the development of methods and theories during the ten years must be indicated, but also some of the more significant new data that anthropologists made available.

Prehistoric Archaeology.—The story of the evolution of human physical forms underwent drastic revision as a result of new finds. The system of classification of prehistoric old world cultures was critically re-examined, and new terminologies and points of view were developed; the problem of the coming of man to the Americas was restated, and the succession of cultures in many parts of the new world during the period before European contact was established was clarified.

At the beginning of the decade there was general agreement concerning the sequence of forms that marked the course of human evolution. First came the Java ape man (Pithecanthropus erectus), then the Peking form (Sinanthropus pekinensis), discovered in 1929, and then Piltdown man (Eoanthropus dawsoni), though there had always been some debate regarding the nature of these remains. "Human" types followed-Heidelberg man, Neanderthal man and finally Cro-Magnon, the earliest form of Homo sapiens, and the first representative of modern man on earth. Certain African finds, such as the Rhodesian skull and the South African Australopithecus, were believed to be shoots off the main evolutionary tree, though the former was admitted to be of Neanderthal affiliation. All these forms were held to belong to different species, each of which had replaced the preceding one, and no crossing between them was postulated.

New finds, especially from the far east, threw open all these assumptions to re-examination. F. Weidenreich, who most exhaustively analyzed the data, new and old, advanced hypotheses some of which would be debated for years. His conclusions concerning the significance of these finds for problems of the evolution of the human form and the differentiation of races were made available in 1946 to the lay reader in a short summary published under the title Apes, Giants and Men. Definitive statements of his conclusions for the scientific world were contained in his monographs, The Skull of Sinanthropus Pekinensis (1943), and Giant Early Man from Java and China (1945).

The new finds were made principally by G. H. R. von Koenigswald. His discoveries began in 1935 with the find-



Skeletal remains of prehistoric California man unearthed by University of California scientists near Lodi, in the Sacramento valley, during Nov. 1937

ing, in a Hong Kong apothecary shop, of a great tooth that, as he believed, came from a giant ape, which he named Gigantopithecus blacki. In 1939, however, when excavating at Trinil, the site where Pithecanthropus had been recovered many years before, he discovered what was first regarded as a large male skull of this species. In 1941, however, in central Java he came upon one and perhaps two Pithecanthropus-like mandibles, so large that it had to be assumed that they derived from a different form. In the meantime, Von Koenigswald, in 1937, had acquired a second great tooth from another Chinese apothecary shop, and two years later a third. On study, it became apparent that these teeth had not belonged to a giant ape, but to a giant man, which Weidenreich maintained should have been called Gigantanthropus rather than Gigantopithecus. This led to a reconsideration of the evolutionary position of the Java finds, with the result that the jawbones were recognized as another giant early type and named Meganthropus palaeojavanicus, while the new large Pithecanthropus skull was called Pithecanthropus robustus.

Other discoveries of importance, made elsewhere, were analyzed during these years. Work at the site where Sinanthropus pekinensis had been recovered progressed until halted by the invasion of China by Japan, with the result that a large series of remains, from a considerable number of individuals came to light. Work on the significant Mt. Carmel finds went forward, analysis proving that this was a transitional form between Neanderthal man and Homo sapiens. The discovery in England of the Swanscombe re-

mains, lodged in middle Pleistocene deposits, was followed by the announcement of the findings of a commission of the British Association for the Advancement of Science that left no doubt of its significance as showing that a type morphologically closer to modern man than Neanderthal had existed in this early period. Further finds in South Africa by R. Broom brought this area prominently into the picture as a region where significant steps in the evolution of man occurred.

At the end of the decade, then, the picture of the development of man differed in several important respects from the conception of it held at the beginning. Geographical perspective was re-established, the preponderant role assigned Europe in the process of human evolution being corrected by a realization of the importance of forms that had developed in the far east and Africa. A high degree of variability for certain prehistoric types was proved, as well as the fact that forms manifesting differing degrees of morphological development had coexisted from earliest times. This led to hypotheses that were the subject of considerable controversy-that all so-called "human" and "protohuman" types must belong to a single species, mutually fertile as they are today; that present-day races must be thought of as far older in point of origin than had been assumed; and that the human animal represents racial mixture to a degree, and over a period of time hitherto unrealized. Most dramatic was the question raised whether earliest man may not have been a giant form, the human adventure thus having been marked by diminution in the size of successive types, rather than each having been larger than its predecessor.

The study of the prehistoric development of culture was marked by a re-examination of pre-existing approaches to the data. Numerous discussions of this problem were published in the Proceedings of the Prehistoric Society of England, where Dorothy Garrod and others pressed arguments for the reclassification of prehistoric cultures on the basis of industry types rather than in terms of a world-wide application of a presumed succession of lithic forms derived from the study of European sites. A similar position was taken by H. L. Movius, Jr., in whose monograph "Early Man and Pleistocene Stratigraphy in Southern and Eastern Asia" (in the Papers of the Peabody museum, 1944) the applicability of conventional designations was rejected in favour of the two generic types "hand-ax cultures" and "chopping-tool cultures." Similarly, G. E. Daniels, in a short but significant work entitled The Three Ages (1943), presented the case against the use of the time-honoured classification of prehistoric cultures into stone, bronze and iron ages. He pointed out that these were applicable only to Scandinavian prehistory, from which they had been derived, and that designations such as "core" and "flake" industries were far preferable to "old stone age," "middle stone age," much like O. Menghin, the Austrian prehistorian, who earlier suggested the term Protolithic for lower and middle Palaeolithic, and Miolithic for upper Palaeolithic and Mesolithic "ages."

Of greater significance than these terminological disputes was the development by V. Gordon Childe of a functional approach to archaeology, in his works Man Makes Himself (1937) and What Happened in History (1942). His use of outmoded designations such as "savagery" and "barbarism" for prehistoric civilizations, however, represented a distinct regression in terminology. He envisaged the development of human civilization as having been made possible by three great revolutions. The first was the Neolithic Revolution, which changed palaeolithic hunting, foodgathering society into stable groupings through the estab-

lishment of an assured and abundant food supply as the result of the domestication of animals and plants. Then, with the discovery of metalworking, wheeled transport and irrigation, came the Urban Revolution that placed man in cities and was marked by the rise of foreign trade, industrial specialization, social stratification and slavery and dynasties. Finally came the Industrial Revolution, with the power machine and the techniques of science. Whether the decade 1937–46 witnessed the fourth, or Atomic Revolution, only time could tell.

In new world archaeology, where problems differed from those of the Euro-Asiatic-African area, the decade witnessed a heightened intensity of field investigation and a sharpening of techniques. The summary of the evidence for the antiquity of man in America by F. H. H. Roberts, Jr., "The New World Paleo-Indian" (Ann. Report, Smithsonian Institution, 1944, pp. 403-434), which presented the evidence thus far available on the antiquity of man in America, indicated that while man may have migrated to the new world from Asia toward the end of the Pleistocene, many of the animals killed by the early peoples constituted what were usually considered Pleistocene forms that "seem to have survived through the transition to Recent times and then to have become extinct rather suddenly." As to the controversy concerning the time man reached the new world, greater hospitality was given to the idea that longer periods than the conventional 10,000 years accepted earlier may have elapsed since his advent.

Techniques of archaeological study were marked by continued refinement of the dendrochronological methods of dating by the scrutiny of tree-ring patterns, with the extension of this method from southwest sites to those of the Mississippi valley. Methods of analysis were improved, also, when midwest archaeologists, following W. C. McKern, agreed on a terminology that named a local find as a focus, related to an aspect of a wider but still restricted form of a culture called a phase, of a pattern that, either by itself or in combination with another, characterized an entire area. This terminology was effectively employed by F. C. Cole and T. Duell, in their work Rediscovering Illinois (1937) which offered an excellent summary of Mississippi valley archaeology in the light of modern methods of study. For the rest, great archaeological activity in Mexico, Central and South America, carried on through the co-operative efforts of institutions of higher learning and governmental organizations of all countries concerned, marked the period. (See also Archaeology.)

Physical Anthropology.—The trend was steadily toward the study of the more dynamic aspects of human biology as against the description and classification of racial and subracial groupings, though much work of the older kind continued to appear in the journals, and the study of constitutional and somatic types gave a new impetus to the classificatory approach. C. Coon's Races of Europe (1939) was the most ambitious attempt made during the decade at racial classification. It was accorded a mixed reception, as was another study by E. A. Hooton in criminal anthropology which, in a more modern application of the Lombrosian approach, concluded that persons of certain physical types tended to commit particular types of crimes. Continuing and refining the earlier work of the German student, E. Kretschmer, W. H. Sheldon, in his volumes The Varieties of Human Physique (1940) and The Varieties of Human Temperament (1942), devised a series of "somatotypes" which were held to reflect temperamental and psychological predispositions as well as to define constitutional types. Sheldon's methods, no less than his conclusions, raised considerable controversy, but work along

the lines he laid down continued to be actively prosecuted. The disastrous consequences of the use of the concept of race for political ends, as manifest in the racist dogmas of the nazis, had many repercussions among physical anthropologists. Statements were adopted by several anthropological societies protesting against the misuse of scientific findings concerning human physical type, and considerable sentiment was manifest at the 1938 Copenhagen meeting of the International Anthropological congress against the racist sentiments voiced by E. Fischer, the fuehrer of the German delegation. G. M. Morant's Races of Central Europe (1939) outstandingly demonstrated how inept was the idea that the populations of this area could be classified as belonging to different races. A pamphlet by R. Benedict and G. Weltfish, The Races of Man (1943), explaining the facts about race, though banned by the U.S. army and refused circulation by United service organizations (U.S.O.), sold over 1,000,000 copies. A more extended analysis by M. F. Ashley Montagu, Man's Most Dangerous Myth: the Fallacy of Race, appeared in its second revised edition (1945). In England, We Europeans (1936), by J. S. Huxley and A. C. Haddon had attracted wide attention, while G. Dahlberg's Race, Reason and Rubbish, a Primer of Race Biology (1942), contributed a telling Scandinavian

contribution to anti-racism. Controversy over the 1910 findings of F. Boas regarding the change in bodily form of immigrants continued. The weight of accumulating evidence, however, supported the fundamental thesis of this scholar, whose death was the heaviest single loss to all branches of anthropology in a decade marked by the death of an unusually large number of outstanding anthropologists. A critique of Boas' statistical approach by R. A. Fisher and H. Grey (1937) drew a reply from Boas defending his methods. In studies by H. L. Shapiro on Hawaiians, published in the volume Migration and Environment (1939) and by M. S. Goldstein on Mexicans, Demographic and Bodily Changes in Descendants of Mexican Immigrants (1943), these independent investigators obtained results that were essentially the same as those of Boas' earlier research. It seemed likely that the controversy over heredity versus environment would be resolved by the recognition of the fact that organisms do not inherit traits, but limits within which they may vary in accordance with their individual life experience. (See also Psychology.)

Interest in the problems of human growth and development, carried on earlier by such students as R. Martin in Germany and F. Boas and T. W. Todd in the United States, was intensified. Added to this, however, was concern with the terminal periods of the human life-span, as was shown by the institution of a Journal of Gerontology. Studies of the problems of child growth were aided and stimulated by the work of W. M. Krogman, The Growth of Man (Tabulae Biologicae, vol. xx, 1941), which contained tables that incorporated the results of all studies in any aspect of child growth. The study of human heredity continued, in the main, to rest in the hands of animal geneticists and others whose point of view did not take into adequate account the importance of nonbiological tradition in influencing physical type through selection in mating, and in shaping other aspects of population formation.

Linguistics.—The field of anthropological linguistics was marked by continued refinement of method. The earlier controversy over the validity of the phonemic approach to linguistic analysis died down with the recognition of the values in this attack, so that linguists were freed to use this

tool rather than required to devote effort in justifying it. The decade's greatest gains were in the study of American Indian and African languages, to the latter of which much effort was given by English and continental students, though research in Australian and Oceanic tongues also went forward. As the decade ended, work had begun under the auspices of the International African institute looking toward publication of a handbook of African languages, while in the U.S. the International Journal of American Linguistics, founded by F. Boas, reappeared under the editorship of C. Voegelin, after a lapse of a number of years, and a new map of American Indian language families was issued by the American Ethnological society.

The knowledge of the anthropological linguists was made great use of during World War II, particularly in the United States. In the army area and language training program, and in army and navy military government schools, where men were taught the ways of life of peoples with whom they would be required to deal, the intensive language training program in a few months equipped them to speak and understand languages that were earlier held to take years to learn. This was accomplished principally by employing native speakers of these tongues, in a way analogous to that in which anthropological linguists used informants in the field study of unwritten languages. Because it differed radically from earlier methods of language teaching, because of the success that attended its use, and because of its implications for revision of peacetime language study, this method was much discussed. Its influence, however, was increasingly felt in university language instruction. The recognition of the values inherent in the study of pidgin and creole dialects was a significant aspect of the general movement which tended to broaden the focus of interest of all language students beyond their concern with Indo-European tongues. A notable effort in this direction was the publication by the Modern Language association of the Grammar of Melanesian Pidgin (1943) by R. A. Hall, Jr.

Cultural Anthropology.—Newer developments in this field must be considered against a background of the continued prosecution of research and publication along lines that were well established at the beginning of the decade. In all the countries of western Europe, notable achievements of this kind were recorded, especially in France, Belgium, the Netherlands and Denmark, where work went on despite the German occupation.

One of the most important single events was the holding of the second International Anthropological congress in Aug. 1938, in Copenhagen, that brought together a larger and more representative gathering of anthropologists from all over the world than probably any previous meeting of its kind. Of great significance, also, was the opening of the Musée de l'Homme in Paris, under the directorship of Professor Paul Rivet. Consolidating the headquarters of all the French anthropological societies, and comprising the centre of all anthropological teaching in Paris, its influence was quickly felt. In England, the research program of the International African institute went steadily forward, and the position of anthropology in English universities was strengthened with the appointment of A. R. Radcliffe-Brown to a chair of anthropology in Oxford, giving that institution its first professor in the discipline since the death of E. B. Tylor many years before. English anthropological journals continued to issue during the entire period of the war.

A number of new journals appeared during the decade,

and most older continental publications carried on despite the war. Ethnos, G. K. Lindblom, editor, published in Sweden, and the various museum publications of that country, came out regularly; in Denmark, a new society devoted to arctic research, with a journal entitled Acta Arctica Scandinavica, was begun despite the occupation. During this time, also, the centenary of the founding of the department of ethnography at the National Museum of Denmark was celebrated by initiating a new series of reports. Older Russian periodicals continued to appear, and a new one, entitled Kratkie Soobcheniia, was first issued in 1945. An enlargement of the program of the Institut Français d'Afrique Noire, and the regular issuance of its periodical, Notes Africaines, was achieved after the liberation of Dakar. Formation of a Palestine Institute for Folklore and Ethnology was announced, and its journal, Edoth. completed its first volume. In China, most of the anthropologists, like other scholars, moved west before the Japanese invasion. One result of this migration was the strengthening of the West China Frontier Research insti-

In the new world, the Southwestern Journal of Anthropology, under the editorship of L. Spier, began publication in 1943. Acta Americana, the organ of the Inter-American Society of Anthropology and Geography, edited by R. Beals, appeared shortly after the formation of that organization in 1942. In 1945 the first number of Afroamerica. the journal of the new International Institute of Afro-American Studies in Mexico City, was issued. The South African journal, Bantu Studies, broadened its field of interest as indicated in its new title, African Studies. A development also to be noted in this area was the founding of an anthropological research centre in northern Rhodesia, the Rhodes-Livingstone institute, which by the end of the decade had initiated a vigorous program of field investigation and publication.

The wealth of materials in monographic series and individual books precludes mention of more than a few of those which tended to consolidate and amplify earlier points of view. The appearance of a selection of the scientific papers of F. Boas under the title Race, Language and Culture in 1939 not only made many of his more important contributions more generally available than before, but was also a powerful reminder of the unity of anthropological science, and thus acted as a check against certain centrifugal forces resulting from specialization in its several branches. Pater W. Schmidt brought out his Handbuch der Methode der Kulturhistorischen Ethnologie (1937, published in 1939 in English translation), making available a systematic exposition of the position of the extreme diffusionist school. L. Lévy-Bruhl, before his death in 1940, published a final work in his series of studies of primitive mentality, L'Expérience Mystique . . . chez les Primitifs, wherein he somewhat modified the position he had previously held, and for which he had been criticized as unrealistic by anthropologists who had firsthand field experience with nonliterate folk. R. Thurnwald's five volume work, Die Menschliche Gesellschaft (1937), was an extended exposition of the position of this German functionalist; B. Malinowski, the better-known exponent of functionalism, before his death in 1942, completed a statement of his approach to the study of culture, which appeared in 1944 under the title A Scientific Theory of Culture, and Other Essays. A. L. Kroeber in 1945 published the results of his investigation of the problem of changing emphases in human civilization, entitled Configurations of Culture Growth, a work that at once gave rise to contro versial discussion.

In the field of ethnography, there could be noted the issuance in 1946 of the first two volumes of the *Handbook* of South American Indians, edited by J. Stewart, while in the same year J. R. Swanton capped the work of a lifetime with his definitive monograph, The Indians of the Southeastern United States. A. C. Haddon, whose death in 1943, like that of C. G. Seligman in 1940, was one of the major losses to English anthropology, published a summary volume on the work of the famous Torres Straits expedition.

The new lines along which students of culture began to direct their investigations were: (1) the study of the impact of convention on the individual; (2) the study of acculturation, with stress laid on contemporary culture-contact; (3) intensive study of the economic, political and legal institutions of primitive peoples and (4) applied or practical anthropology.

The study of personality and culture began with the earlier interest of E. Sapir in the problem of how the individual reacts to, and is shaped by his culture. With its emphasis on its cross-disciplinary character, involving, as it did, both anthropological and psychological techniques, it developed so rapidly that by 1946, in the U.S., at least, it was recognized as an important subdivision of anthropological enquiry. Its growth could roughly be divided into three stages. The first was essentially ethnological, and was concerned with the problem of cultural configurations. With this approach were associated the names of R. Benedict, whose book, Patterns of Culture, laid the theoretical base for the classification of cultures in psychological terms, and M. Mead, whose consolidated volume of earlier monographs, From the South Seas (1939), documented the approach with a rich store of ethnographic data.

Stress was next laid on the individual. A given culture was resolved into those basic disciplines which, operating in terms of primary and secondary institutions, were held to play on the developing personalities of the members of a society and thus made for their basic (later termed modal) personality structure. This point of view was set forth by A. Kardiner, a psychoanalyst, who worked in close association with R. Linton. Kardiner's initial book, The Individual and His Society (1939), was followed by elaborations of his thesis in other volumes, while Linton developed his point of view in a work entitled The Cultural Background of Personality (1945).

Relatively little field research was, however, carried on to test the hypothesis of the modal personality structure. An outstanding exception was the work of C. Dubois, among the Melanesian Alorese, published in the monograph entitled Alor (1944). The problem of developing methods by which personality types might be studied through field investigation led to the third stage in the development of personality and culture studies, where projective techniques, especially the Rorschach inkblot tests, were used. A number of students applied these tests, but the most consistent user was A. I. Hallowell, whose paper "The Rorschach Technique in the Study of Personality and Culture" (Amer. Anthr., 1945, pp. 195–210), summarized the status of work with this instrument and discussed its possible further application. (See also Psychology.)

Previous interest in the study of acculturation was extended in the U.S. by the appointment in 1934 of a committee of the Social Science Research council under the chairmanship of R. Redfield. This committee in 1936 published in various anthropological journals its definition of the term and an outline to guide research in problems involving culture contact. In 1938 a research memorandum entitled *Acculturation*, by M. J. Herskovits, further an-

alyzed methods and problems, and discussed existing studies. In England and the British colonies, the study of culture contact was encouraged because of the exigencies of the colonial problem, wherein anthropologists were called on, as B. Malinowski put it, to cushion the contact of natives with European culture.

Aside from practical considerations, the importance of the study of acculturation was realized to lie in the fact that the problems earlier studied as diffusion, whereby the borrowings resultant on contact between peoples were considered in terms of historical reconstructions, could be analyzed on the basis of actual occurrences, witnessed and set down by fieldworkers. The concept of a pure culture was thus given over in favour of a more realistic position concerning the ubiquity of contacts between peoples that had resulted in cultural change. In consequence, fieldwork more and more took into account all the data concerning a people, however mixed its culture might be, at the same time reconstructing, in more or less hypothetical form, the cultural "base-line" from which change began. A methodological offshoot of acculturation studies was the stress laid on an ethnohistorical attack. Ethnohistory, essential in studies of culture contact, combined ethnographic and archaeological findings with materials derived from historical documents bearing on a given contact between peoples. It thus afforded a surer factual basis for analysis of the processes involved than would otherwise be possible.

The importance of the study of economic, political and legal systems of primitive peoples was stressed in ethnographic as well as ethnological works. B. Malinowski, who laid emphasis on the integration of such data with other aspects of culture, was one of the first to underscore its im portance for an understanding of culture in general. R. Firth's Primitive Polynesian Economy (1939), following an earlier work, was more concerned with the application of economic theory to non-European cultures, as was D. M. Goodfellow's Principles of Economic Sociology (1937). which treated primarily of Bantu economy. R. Thurnwald's work already mentioned, which also appeared in an English version, envisaged a still broader approach with, however, an ethnological rather than an economic orientation. M. J. Herskovits' Economic Life of Primitive Peoples (1940) emphasized the theoretical implications of economic phenomena in nonmachine cultures. Many monographic studies appeared to make economic data from various parts of the primitive world available. Outstanding for the freshness of its approach was the work of A. I. Richards, Land, Labour and Diet in Northern Rhodesia (1939).

The study of law and political structures was not marked by any general works, though several papers by A. R. Radcliffe-Brown on the nature of primitive law acted as a stimulus to study, while the analysis of Cheyenne law by A. Hoebel and K. Llewellyn, The Cheyenne Way (1941), and of Tswana law by I. Schapera, A Handbook of Tswana Law and Custom (1938), did much to provide data on this aspect of primitive life. The work African Political Systems (1940), edited by M. Fortes and E. E. Evans-Pritchard, gave a useful overview of the political structures of Africa, and had an introductory chapter by the editors that was a distinguished contribution to the developing field of comparative politics.

Applied Anthropology.—Though latent in anthropological thought for many years, applied anthropology flowered during the decade under the impact of the war effort, when anthropologists were called on as never before to give of their knowledge of the far places of the earth in solving

many practical problems that arose in the course of global warfare. The use of anthropology in the administration of dependent peoples (as colonial tribes came to be called) was stimulated by the publication of Lord Haley's volume An African Survey (1938). "Practical anthropology," as it was termed in England, or "colonial anthropology" as it was named on the continent, received stronger governmental support than ever before. Anthropological training was given aspiring colonial officers on a broad scale, while more and more anthropologists were retained to study the problems of administering native peoples. The use of anthropologists in the Indian service of the United States increased. They were also employed in considerable number by the War Relocation authority. The volume by A. H. Leighton, The Governing of Men (1944), provided an effective account of how anthropological techniques were used in this situation. The application of anthropological methods in the study of problems of industry was urged, but its advisability was seriously questioned by many anthropologists. Two organizations devoted to applied anthropology were formed, the Society for Applied Anthropology, which published the journal Applied Anthropology, and the Institute for Ethnic Affairs, headed by John Collier. In Mexico, the journal America Indigena appeared, devoted to the discussion of practical problems of Indian administration in the Americas.

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Races of Mankind.—Any classification of the races of mankind must rest on the major fact that all peoples of the earth belong to the same genus and the same species, Homo sapiens (Linnaeus). In other words, all people are fundamentally much more alike than they are different. There are, of course, certain observable outward differences in physical appearance, such as skin colour, hair colour and form, eye colour and so on. By using these criteria of different appearance, and about a dozen others, it is scientifically possible to divide mankind into major divisions (subspecies) and subdivisions (sub-subspecies). Most anthropologists call the former "stocks" and the latter "races." We may define race, simply, as a group set apart by a more or less definite combination of physical traits that are transmitted in hereditary descent. A stock becomes, accordingly, a certain cluster of races.

Scientists conventionally recognize three major stocks: Caucasoid, Mongoloid, Negroid, often referred to as White, Yellow and Black. Basically these are the peoples of Europe, Asia, and Africa and Melanesia, respectively. The use of the terms "White," "Yellow" and "Black" as the sole criterion of classification is not quite correct, for there

	I. I	Pigmentation	
Trait Skin	Caucasoid Pale ruddy white in N. Europe to light brown in S. Europe, to dark brown in India	Negroid Light brown to brown in E. Africa, dark brown to brown-black in W. Africa and Melanesia, the Bush- man is yellowish-brown	Mongoloid Quite generally light brown with a saffron undertone, to yel- lowish-brown
Hair	Light blond in N. Europe to blond and light brown in C. Europe, to dark brown in S. Europe and India	Uniformly dark brown to brown-black	Uniformly dark brown to brown- black
Eye (1) Pupil	Light blue in N. Europe to brown and dark brown in S. Europe and India	Uniformly brown to dark brown	Uniformly dark brown
(2) Sciera	Uniformly clear (white to bluish- white)	Tends to be mottled and flecked; yellow- ish-brown	Clear to mottled and flecked (not well known)
	II. Traits	of Head and Face	
Trait Head shape	Caucasoid Long, narrow, and high in N. Europe, to moder- ately long, broad and high in C. Europe and ladia, to short, broad and very high in S. E. Europe and Asia Minor	Negroid Tends to be long, narrow and moder- ately high, the Pygmies of Africa and Oceania tend to be shorter and broader headed	Mongoloid Tends to be moder- ately short, broad, and moderately high, though in N. China there is a tendency to long- headedness
Hair form	Straight in N. Europe to wavy and slightly curly in S. Europe and India	Wavy to curly in E. Africa to woolly and frizzly in W. and S. Africa and Oceania	Uniformly straight
Hair texture	Fine in N. Europe to medium in S. Europe and India	Uniformly coarse and wiry	Uniformly very coarse
Eye fold	No fold is the rule, but a lateral vertical fold often occurs in N. Europe	A medial vertical fold is often found in W. Africa, the Bushman have a very charac- teristic, upper lid overhang	There is a marked tendency to a medi- al epicanthic fold (so-called "Mongo- lian" eye fold)
Ear	Generally of moder- ate size, with good "helical roll"	Generally small, with poor "helical roll," the Bushman ear has very little roll and appears "crumpled"	Generally of moder- ate size, with good "helical roll"
Face (1) Height	High in N. Europe to medium in S. Europe and India	High in E. Africa to medium in W. Africa and Oceania	Medium in N. China to low in S. China and some Japanese
(2) Breadth	Narrow in N. Europe to medium in S. Europe and India	Narrow in E. Africa to medium in W. Africa and Oceania	Broad in Asiatics gen- erally to very broad in some Amerinds.
(3) Cheek- bones	Generally compressed and not projecting	Generally compressed and not projecting, in the Bushman are broad and "high"	Uniformly arched and projecting for- ward to give "high" cheekbone
(4) Contour or profile	Uniformly straight as seen from side	Generally slants down and forward as seen from side	Generally straight as seen from side
Nose (1) Root	Uniformly high and narrow	Moderately high and narrow in E. Africa to low and broad in W. Africa	Tendency to moder- ately low and broad
(2) Bridge	Straight in W. Europe, S. Europe and some peoples of India, con- cave in N. E. Europe, convex in S. E. Europe and Asia Minor	Tends to be straight to weakly convex; uniformly low	Tends to be straight, broad and low
(3) Wings	Uniformly narrow to moderate	Moderately narrow in E. Africa, very wide in W. Africa and Oceania	Tends to be moder- ately broad
(4) Nostrils	Tends to be an oval, with long axis antero-posterior	Rounded in W. Africa, to transverse oval in E. Africa	Generally an antero- posterior oval, but tends to rounded in S. China
(5) Tip	Directed forward in N. and S. Europe and India, upwards in N.E. Europe, downwards in S.E. Europe and Asia Minor	Directed forward in E. Africa, but thick and rounded in W. Africa and Oceania	Generally directed forward, with tend- ency to slight down- ward inclination
Mouth (1) Opening or fissure	Generally moderately broad	Generally moderately broad	Moderately broad in Asiatics to very broad in some Amerinds
(2) Lips	Thin in N. Europe, to moderately thick in rest of Europe and India	Moderately thick in E. Africa to very thick and everted in W. Africa	Generally moder- ately thick

Table I.—(continued) III. General Body Traits

Trait Stature	Caucasoid Tall in N. Europe and N.W. India, moder- ately tall in C. and S.E. Europe, short in S. Europe and rest of India	Negroid Tall in E. Africa, moderately tall in W. Africa and Oceania, very short (dwarfed) in Pygmies of Africa and Oceania	Mongoloid Tall in N. China and some Amerinds, but short to moderately tall elsewhere
Body hair	Generally profuse, especially in S.E. Europe and among Ainu; S. Europe smoother skinned	Uniformly scant	Uniformly very scar
Vertebral column	Strongly S-curved, with marked lumbar curve	Moderately S-curved, with weak lumbar curve	Intermediate be- tween Caucasoids and Negroids
Pelvis	Broad, shallow	Narrow, deep	Moderately broad and deep
Limb pro- portions	Arms and ^l egs not disproportionately long	Arms and legs long relative to trunk; fore- arm and lower leg relatively long	Legs tend to be short, relative to trunk length, other- wise limb segments not disproportionate
Breast form	Hemispherical	Conical	Disk-shaped
Buttock contour (female)	Generally prominent	Moderately prominent to very prominent (Bushwomen are steatopygous)	Moderately prominent
General body build	Generally muscular with tendency to heaviness	Generally muscular, but with marked linearity in E. Africa	Uniformly muscular

is a considerable range of variation within each stock. In fact, any single stock—and even more so, any given race—cannot be defined by a single physical trait, or even two or three. It is a combination or complex, relatively unique to the stock or race that sets it apart.

In Table I, the physical characteristics of the three stocks are given. It will be noted that in most instances each single trait is so variable that it cuts right across stock lines. This drives home the point made above, namely, that all traits must be used in setting up a stock. In the table, therefore, the three major stocks are defined by reading the columns vertically, not horizontally. For example, there are "white" Caucasoids who are brown-skinned, and "black" Negroids that are light brown in skin colour; similarly there are long-headed Caucasoids and long-headed Negroids, and there are round-headed Caucasoids and round-headed Mongoloids; or again, there are very tall Caucasoids in Denmark, very tall Negroids in East Africa, and very tall Mongoloids in Tierra del Fuego. For each trait it can be demonstrated that variability is so great that a single trait has little or no diagnostic value. True, there are no really white Negroids, or really black Caucasoids, but it is still well-nigh impossible to define a stock, or a race within a stock, by one or two traits. That is what is meant by saying that reading Table I horizontally will not serve to classify a stock.

Now, still observe Table I. Each stock can be defined by the summation of traits vertically listed in the appropriate column, *i.e.*, Caucasoid, Negroid, Mongoloid. It is the aggregate, the complex, of all the traits that is used in stock diagnosis. On this basis, science validates the definition of the three major stocks of mankind.

What has been demonstrated so far concerning stock variability is of importance in the classification of races within each stock. It is only because mankind is so variable—even though all human beings belong to the species *Homo sapiens*—that he can be logically and fairly accurately divided and subdivided into major groups (stocks) and minor groups (races).

Each stock has been divided into many or few races, depending upon the author consulted, or the state of knowledge concerning the group in question. In Table II there is presented a racial classification that is generally acceptable to modern physical anthropologists.

An inspection of Table II reveals that more is known about the Caucasoids than the Negroids, and more about the Negroids than the Mongoloids—indeed, knowledge of the last was still very inadequate at the end of the decade 1937–46. Knowledge of the Caucasoids—the peoples of Europe—was sufficient to permit several conclusions: (1) there is no "pure" race; (2) no single state or nation is composed of a single race; (3) all peoples of Europe are the product of an age-old mixture of races.

The Germans, for example, are a composite of Nordic, Mediterranean, Alpine, Dinaric and east Baltic; the English show traces of Nordic, Alpine, Dinaric and Medi-

	Table II.—The Races of Mankind								
	I. Caucasoids								
	Race	Habitat							
1.	"Archaic" or primitive Cauca- soids	These are the Ainu of Japan and the Australian aborigines. The latter, referred to as Australoids, are a racial element in the peoples of Melanesia; there is some Negroid admixture.							
2.	Mediterranean	S. Europe generally; also in N. and N.E. Africa, and a basic element in Asia Minor (Arabs) and N. India; found sporadically in C. Europe (e.g., Wales); probably the original Caucasoid race.							
3.	Alpine	C. Europe generally, extending east to the area of the Slavic- speaking peoples.							
4.	Nordic	N. Europe generally, especially in Scandinavia, N.W. and S.W. Germany and the British Isles; found sporadically in C. Europe (e.g., Holland).							
5.	East Baltic	Found in the circum-Baltic area of N.E. Europe; is the basic element in the Finns and the Lapps, both of whom—especially the latter—show Mongoloid admixture.							
6.	Dinaric	S.E. Europe generally: the Balkans and the Caucasus.							
7.	Armenoid	In Asia-Minor: Anatolia, Iraq, Iran.							
8.	Indo-Afghan or East Indian	In Afghanistan and the northern half of India, especially N.W. India, basically a pigmented Mediterranean type.							
9.	Polynesian	In the Pacific islands: Samoa, New Zealand, Hawaiian Islands, Marquesas, Easter Island, the Polynesians are basically Cau- casoid, but there is some Mongoloid and a slight Negroid admixture.							
11 Negroids									
		II. Negroids							
	Race								
1.	Race Hamitic, or Ethiopian	II. Negroids Habitat N.E. Africa: Ethiopia, Somaliland. The type is a mixture of Mediterranean (Caucasoid) plus Nilote (Negroid).							
	Hamitic, or	Habitat N.E. Africa: Ethiopia, Somaliland. The type is a mixture of							
2.	Hamitic, or Ethiopian	Habitat N.E. Africa: Ethiopia, Somaliland. The type is a mixture of Mediterranean (Caucasoid) plus Nilote (Negroid). E. Africa generally, especially Tanganyika and Kenya; the type is intermediate between the West African and Hamitic							
2. 3.	Hamitic, or Ethiopian Nilote West African,	Habitat N.E. Africa: Ethiopia, Somaliland. The type is a mixture of Mediterranean (Caucasoid) plus Nilote (Negroid). E. Africa generally, especially Tanganyika and Kenya; the type is intermediate between the West African and Hamitic types. W. Africa generally, especially Nigeria, Senegambia, Dahomey, the Gold Coast. These are often called the "true" Negroes. It is from this race that the bulk of Amernegroes							
2. 3. 4.	Hamitic, or Ethiopian Nilote West African, or Sudanic Bantu (really Bantu-speaking	Habitat N.E. Africa: Ethiopia, Somaliland. The type is a mixture of Mediterranean (Caucasoid) plus Nilote (Negroid). E. Africa generally, especially Tanganyika and Kenya; the type is intermediate between the West African and Hamitic types. W. Africa generally, especially Nigeria, Senegambia, Dahomey, the Gold Coast. These are often called the "true" Negroes. It is from this race that the bulk of Amernegroes have come. S. and S.W. Africa; the Zulus are typical Bantus, There is an							
2. 3. 4.	Hamitic, or Ethiopian Nilote West African, or Sudanic Bantu (really Bantu-speaking peoples) Hottentot-	Habitat N.E. Africa: Ethiopia, Somaliland. The type is a mixture of Mediterranean (Caucasoid) plus Nilote (Negroid). E. Africa generally, especially Tanganyika and Kenya; the type is intermediate between the West African and Hamitic types. W. Africa generally, especially Nigeria, Senegambia, Dahomey, the Gold Coast. These are often called the "true" Negroes. It is from this race that the bulk of Amernegroes have come. S. and S.W. Africa; the Zulus are typical Bantus, There is an evident admixture of Hamitic and Sudanic. Kalahari desert of S. Africa; these people are racial puzzles: they show some Pygmy traits, some Negroid traits and possibly							
 3. 4. 6. 	Hamitic, or Ethiopian Nilote West African, or Sudanic Bantu (really Bantu-speaking peoples) Hottentot-Bushman	Habitat N.E. Africa: Ethiopia, Somaliland. The type is a mixture of Mediterranean (Caucasoid) plus Nilote (Negroid). E. Africa generally, especially Tanganyika and Kenya; the type is intermediate between the West African and Hamitic types. W. Africa generally, especially Nigeria, Senegambia, Dahomey, the Gold Coast. These are often called the "true" Negroes. It is from this race that the bulk of Amernegroes have come. S. and S.W. Africa; the Zulus are typical Bantus. There is an evident admixture of Hamitic and Sudanic. Kalahari desert of S. Africa; these people are racial puzzles: they show some Pygmy traits, some Negroid traits and possibly some Mongoloid traits.							
 3. 4. 6. 	Hamitic, or Ethiopian Nilote West African, or Sudanic Bantu (really Bantu-speaking peoples) Hottentot-Bushman Pygmies or Negritoes Melanesian (also called Papuan or	Habitat N.E. Africa: Ethiopia, Somaliland. The type is a mixture of Mediterranean (Caucasoid) plus Nilote (Negroid). E. Africa generally, especially Tanganyika and Kenya; the type is intermediate between the West African and Hamitic types. W. Africa generally, especially Nigeria, Senegambia, Dahomey, the Gold Coast. These are often called the "true" Negroes. It is from this race that the bulk of Amernegroes have come. S. and S.W. Africa; the Zulus are typical Bantus. There is an evident admixture of Hamitic and Sudanic. Kalahari desert of S. Africa; these people are racial puzzles: they show some Pygmy traits, some Negroid traits and possibly some Mongoloid traits. Ituri forest in the African Congo, found also in the Malay peninsula, in the Philippines and in Melanesia; the type may be an element in the Veddoids of S. India and Ceylon. Found in Melanesia: Borneo, the Solomons, Fili, the Marshalls. The type is undeniably Negroid, but it shows some Australoid							
 3. 4. 6. 	Hamitic, or Ethiopian Nilote West African, or Sudanic Bantu (really Bantu-speaking peoples) Hottentot-Bushman Pygmies or Negritoes Melanesian (also called Papuan or Oceanic Negro)	Habitat N.E. Africa: Ethiopia, Somaliland. The type is a mixture of Mediterranean (Caucasoid) plus Nilote (Negroid). E. Africa generally, especially Tanganyika and Kenya; the type is intermediate between the West African and Hamitic types. W. Africa generally, especially Nigeria, Senegambia, Dahomey, the Gold Coast. These are often called the "true" Negroes. It is from this race that the bulk of Amernegroes have come. S. and S.W. Africa; the Zulus are typical Bantus. There is an evident admixture of Hamitic and Sudanic. Kalahari desert of S. Africa; these people are racial puzzles: they show some Pygmy traits, some Negroid traits and possibly some Mongoloid traits. Ituri forest in the African Congo, found also in the Malay peninsula, in the Philippines and in Melanesia; the type may be an element in the Veddoids of S. India and Ceylon. Found in Melanesia: Borneo, the Solomons, Fiji, the Marshalls. The type is undeniably Negroid, but it shows some Australoid admixture.							
 3. 4. 6. 7. 	Hamitic, or Ethiopian Nilote West African, or Sudanic Bantu (really Bantu-speaking peoples) Hottentot-Bushman Pygmies or Negritoes Melanesian (also called Papuan or	Habitat N.E. Africa: Ethiopia, Somaliland. The type is a mixture of Mediterranean (Caucasoid) plus Nilote (Negroid). E. Africa generally, especially Tanganyika and Kenya; the type is intermediate between the West African and Hamitic types. W. Africa generally, especially Nigeria, Senegambia, Dahomey, the Gold Coast. These are often called the "true" Negroes. It is from this race that the bulk of Amernegroes have come. S. and S.W. Africa; the Zulus are typical Bantus. There is an evident admixture of Hamitic and Sudanic. Kalahari desert of S. Africa; these people are racial puzzles: they show some Pygmy traits, some Negroid traits and possibly some Mongoloid traits. Ituri forest in the African Congo, found also in the Malay peninsula, in the Philippines and in Melanesia; the type may be an element in the Veddoids of S. India and Ceylon. Found in Melanesia: Borneo, the Solomons, Fiji, the Marshalls. The type is undeniably Negroid, but it shows some Australoid admixture.							

Race	Habitat					
 Palaeo-Mongolic 	S. China and adjacent Burma and Assam.					
2. Sinicus	N. and C. China and Japan.					
3. Siberic	The peoples of Siberia.					
4 7	The end of control Adv. Adv. 19					

4. Turkic The peoples of central Asia and Mongolia.

 Malayan Java, Sumatra, Bali, the Philippines; this is probably the Mongoloid element in the Polynesians.

6. Eskimo N. America, from Alaska eastward to Greenland.

 Amerindian N., C. and S. America; the Amerindian is divided into a number of geographical races.

terranean.

It is best, therefore, to speak of "racial elements," "racial types." or "racial strains," in any given European population.

Europe is, of course, the Caucasoid nucleus. North Africa is the Caucasoid-Negroid contact zone (Hamitic), and central Asia is the Caucasoid-Mongoloid contact zone (Turkic).

In each of these two areas the peoples show transitional types between the two major stocks involved. These transitional types are due, according to some anthropologists, to evolutionary intermediacy, but according to most authorities they represent the results of mixture between races and stocks (W. M. K.)

Anti-Aircraft Artillery

See Munitions of War; Tactics of World War II; World War II.

Anti-Comintern Pact

See FASCISM, GERMANY, HUNGARY; ITALY, JAPAN.

Antigua

See WEST INDIES, BRITISH.

Antilles, Greater and Lesser

See WEST INDIES.

Anti-Lynching Legislation

See LYNCHING.

Antimony

The trend of antimony production in the major coun tries during the years 1937-45 is shown in Table I.

Table I — Wo	Id Productio	on af	Antimony						
1Ch									

(Short tons)											
							1937	1939	1941	1943	1945
Algeria Australia							858 444	247 526	527 525	203 983	ş
Bolivia	:	:	:	:	:	:	7,238	10,202	15,080	18,228	5,614
Canada China	•	٠	٠	٠		٠	20 16,206	511 13,246	1,465 8,806	513 472	773
Czechoslovakia	:	٠	•	:			1,099	1,116	1,813	3 2	8
Italy Mexico	:	:		:	٠		456 10,789	743 7,984	903 11,289	13,873	298 8,877
Peru South Africa .	•	•	:	•		•	1,429	854	1,587 491	2,725 1,720	722 2,260
Turkey		-	:			:	591	507	6	. 9	·
United States . Yugoslavia	٠	:	:	:		٠	1,266 1,595	393 3,678	1,214	5,556 2	1,930
Total							42.550	41.200	48 200	52.100	3

In 1931, the opening of a smelter in Texas, using Mexican ores, had started a shift from China as the chief source of antimony for consumption in the United States. Although China was still the world's largest producer in 1939, the Japanese invasion cut down activities there at the same time that war in Europe was increasing the demand.

As a result, Bolivia and Mexico began to furnish most of the supply. Demand reached its peak in 1942 and 1943, with heavy subsequent declines to prewar levels

Table II —Data of the Antimony Industry in the United States

(5)	ort tons)			
1937	1939	1941	1943	1945
Production, in ore 1,266 In alloys* 1,726	393 1,108	1,214	5,556	1,930
Imports, total 16,720	10,912	2,598 27,504	2,035 29,969	1,992 24,649
In ore 13,818 Metal 1,043	9,448 1.045	19,386 7,469	28,755 932	22,643 627
Other forms† 1,859	419	649	282	1,379
Consumption, primary 18,132 Secondary recovery 12,340	11,609 9,810	29,994 21,629	19,508 15,483	25,761 17,148

*Antimony content of antimonial lead, produced from foreign and domestic ores. †Estimated antimony content of alloys, oxide and liquated sulphide.

Even the demand created by World War II could not build up an appreciable U.S. domestic output of antimony ores; the bulk of the domestic recovery was from concentrates separated from complex ores containing gold, mercury, copper, or tungsten, or from lead-antimony ores that went to smelters of antimonial lead. With the ending of war demand, low metal prices and increasing costs of operation shut down several of the smaller smelters. The same causes led to heavy cuts in output in countries exporting ore to the United States, and in 1946 the shortage of antimony became as acute as at any time during the war—so much so that it became difficult to supply storage batteries for automobiles.

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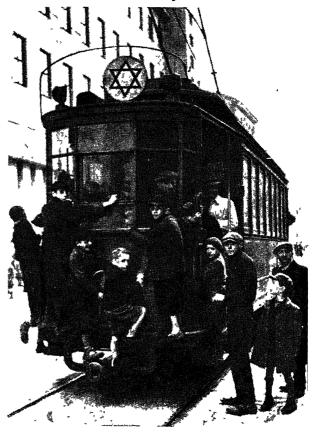
Anti-Saloon League of America

See Societies and Associations.

Anti-Semitism

Anti-Semitism was one of the important social and political forces of the decade 1937–46. Its impact upon Jews resulted in the extermination of one-third of the nearly 16,000,000 of them who had lived in many nations of the world before the rise of Adolph Hitler in 1932. But the nazi use of anti-Semitism as a political weapon in countries other than Germany was a new phenomenon in history. Spearheaded by the indoctrinated international agents of National Socialism, anti-Semitism came to be one of the distinguishing marks of most of the political fronts for fascism in countries like the United States, England and the Latin American nations. It was designed

Street car marked with the Star of David for ghetto dwellers in Warsaw, Poland, during World War II





Typical German raid on the ghetto in Warsaw during the nazi occupation of World War II. The Jewish population of this area was virtually wiped, out before Germany's final defeat

by the Hitler strategists to be used as a divisive and cor-10sive force in the democratic or near-democratic states.

Patterned by the nazi plan, Jews were linked with international communism while fascism, though not always called by its simplest name, was usually portrayed as the defender of western civilization against the "Red" menace. Thus, by indirection, many were drawn into support of anti-Semitic movements, which were really movements directed against the fundamentals of democratic life.

Philosophy of Anti-Semitism.—The philosophical basis of the wave of anti-Semitism was also different. It was peculiarly Teutonic in character. Persecution of Jews was nothing new in world history in 1937. But previous persecutions had been very largely inspired by religious fanaticisms. The dissolution of church and state in modern societies and the general decline of religious fanaticism had held promise for a gradual diminution of anti-Semitism. The mediaeval concept of Jews as a racial or religious nation within other nations was being gradually dissolved in the democratic systems which granted individual rights, regardless of man's racial derivations or religious beliefs.

Perhaps cognizant of these advances, nazi anti-Semitism was projected upon a different philosophical platform. Naziism revived the mediaeval concept of the racial state. Those who were Aryans were acceptable for citizenship. Any who were not Aryans were automatically barred from citizenship. This doctrine had achieved legal sanction and definition in 1935, in the Nuernberg laws, although it had had less far-reaching antecedents in decrees from 1933, when Hitler had come to power. The Nuernberg decrees, declaring "that the purity of the German blood is prerequisite for the future existence of the German people" deprived Jews of all rights of citizenship, forbade intermarriage, denied Jews the right to display the reich or national flag, denied Jewish institutions the exemption from taxation granted public institutions of other faiths, denied all children of Jewish faith the facilities of public schools, etc.

Here, it is worth observing that although the nazi propaganda made much of racial differences of Jews, the leaders of the movement were sometimes hard pressed by realities in the detection of such differences. They resorted to a number of artificial and arbitrary devices. One of the most far-reaching was the decree which compelled everyone who had one grandparent of Jewish faith to call himself a Jew, subject to the discriminatory laws. Jews were compelled to adopt "Jewish" names and to carry identification cards, stamped with a red "J."

All of this "legal" procedure reached a climax and poured over into more violent action in 1938. In November of that year, a half-crazed Jewish boy, a national of Poland, shot Ernst vom Rath, third secretary of the German embassy in Paris. Two days later, vom Rath died. The nazi party then launched the policy of liquidation and extermination which it continued wherever it had power, until the end of the war in 1945.

The alliance of this concept of a racial state, which made Jews racially aliens, with the mystery and fear of communism and the identification of communism as a "Jewish" doctrine, provided a powerful political weapon for any who sought to exploit the sense of insecurity of middle-class groups, whose confidence had been so severely shaken by the deep and prolonged economic depression of the early '30s. The myth of fascism "getting things done" was a powerful factor in giving support to movements which inspired by naziism and sometimes internationally financed by it, were anti-Semitic in character. It was not uncommon to hear the uncritical and unconvinced comment, "Well, maybe Hitler can't be entirely wrong."

Consequences.—The impact of these doctrines varied in accordance with the vitality of democracy or its weakness in any given nation. It was severest in Germany, where this kind of racial anti-Semitism had had a long career as a political instrumentality from the days of Bismarck and the beginning of Germany's not yet realized nationalization. As the Hitler armies moved across Europe they brought with them the Nuernberg decrees or reasonable facsimiles of them. The ethnic-racial-religious bases of many of the central and east European states had long made them anti-Semitic societies. The stimulus of German anti-Semitism, the widespread propaganda machine of fascism and the early successes of Hitler encouraged a



Jewish women slave workers marked with the yellow cross, liberated by troops of the U.S. 9th army near Kaunitz, Germany, in 1945. These girls had been brought from nazi conquered countries and made to work in an ammunition plant

rising tide of anti-Semitism in these ethnically conscious states.

By 1937, the influence of National Socialism was being felt in all the countries of central and eastern Europe. Following the Anschluss in March 1938, the Nuernberg laws were introduced in Austria within two months. In June 1939, following the occupation of Bohemia and Moravia and the granting of "independence" to Slovakia, the nazi legislation was gradually introduced into what had been Czechoslovakia. In Poland and the Baltic states the blitzkrieg of 1939 brought terror to the Jews of those countries, and the stunning fall of the Low Countries and France in 1940 completed nazi control of the continent and sealed Europe's Jews in an inferno of hate about which little could really be learned and only the worst could be feared for five agonizing years. Not for five hundred years, after the Spanish Inquisition, had such stark unmitigated tragedy overtaken so many Jews. And this exceeded that earlier period in extent and irrevoca-

For if the Jews of 15th century Spain could avoid the wrack by conversion, those of 20th century Europe could not evade the arbitrary Hitlerian theories of race. When the curtain had lifted in May 1945, the Jewish population of the European continent, which had numbered about 9,000,000 in 1932, had been halved. The full intensity of that tragedy can be appreciated only when it is realized that nearly 4,000,000 Jews of soviet Russia were not included with those who suffered as victims of anti-Semitism. Elsewhere in the world these doctrines were not without reverberations, although their implementation and effect never reached anything like the condition on the continent.

During the initial successes of fascism, the U.S., England and the Latin American nations were treated to a plethora of "shirt" movements and "nationalistic" cults, practically all of which were either avowedly or philosophically anti-democratic. In most of them anti-Semitism was a major propaganda device. Except for a few isolated incidents there were no physical attacks on Jews, and none of the established democratic states enacted or even seriously considered legislation of a discriminatory nature. There were some anti-Semitic speeches in the congress

of the U.S. and in the English parliament, but there is no evidence that any credence was given them by the membership of these legislatures. In the U.S. several openly anti-Semitic spokesmen were aspirants for public office, but there was apparently a widespread gulf between their popularity at mass meetings and their popularity at the polls. While there may have been anti-Semites in public office, there was no known successful candidacy by any person who used anti-Semitism as a political plank.

In England and the nations of the western hemisphere, the impact of European anti-Semitism was therefore mostly psychological. To some immeasurable extent it may also have spilled over into social relationships between Jews and those not of Jewish faith. Numerous polls, conducted by several of the public opinion sampling organizations all seemed to prove little, in any attempt to measure this highly intangible and elusive phenomenon.

All that could accurately be said is that there was a considerable increase of anti-Semitic activity and propaganda. But whether or not this proved that there was any comparable increase of anti-Semitism was a moot question. For at least some of the financial support for such propagandists and their movements was known to have been imported from Germany, as for example, the German-American bund. Therefore, these did not require grassroots support in the U.S. or England. Many of the less obvious anti-Semitic organizations drew innocent people into movements which advertised themselves as American" or "anti-communist" or "pro-Christian" and muted their anti-Semitism or ware actific muted their anti-Semitism or were anti-Semitic only by indirection. Rather than a "movement" there was apparently a confusion of propagandists, lunatic-fringers, charlatans and political crackpots, most of whom were in vigorous competition with each other. In England the blackshirted movement of Sir Robert Mosley came to a quick and decisive end when Mosley was jailed in the early months of World War II, and the entrance of the U.S. into the war against fascism made anti-Semitism in any overt form suspect and unpopular.

Many students of the problem claimed a perceptible increase in what they called "social" anti-Semitism: the barring of Jews from private clubs, certain hotels mostly of a resort nature, and a general reluctance on the part of Christians to mix socially with Jews. But such charges were difficult to prove. Much of an individual's opinion in any such undemonstrable situation depended upon personal experience and perspective. If there was an increase of such anti-Semitism, at the same time a number of serious efforts were made to stamp it out. The more reputable newspapers in the larger metropolitan centres voluntarily adopted policies of refusing advertising that was obviously discriminatory. While some advertisers practised evasions, there was an almost complete elimination of the "gentiles only" type of ad. At least one state passed a law forbidding resorts to advertise that Jews were unwanted.

Countermeasures.—Any survey of or reference to the organizations which fed anti-Semitism and lived upon it would be only a fragmentary picture. For if there appeared to be an increase in anti-Semitic activity, there was also an increased awareness of the essentially reactionary nature of anti-Semitism and the fundamental nature of its threat to democratic institutions. If Hitler had successfully used anti-Semitism as a political wedge in the nations of Europe, in England and the U.S. that fact had not escaped notice.

Powerful campaigns against anti-Semitism, designed for the most part as educational programs about Jews, were sponsored by numerous nonsectarian or entirely Christian organizations. As vigorously as the anti-Semitic movements pressed their cause, others advanced the argument that anti-Semitism was un-American. "Brotherhood Week" became a national institution in the U.S. in which representatives of Catholicism, Protestantism and Judaism cooperated. The National Conference of Christians and Jews inaugurated a nation-wide program. The pope condemned anti-Semitism, by reminding the Christian world that "spiritually, we are all Semites," and in the summer of 1946, there was a dramatic inter-faith meeting of world-wide proportion in England.

Even during World War II, stories drifted back from Europe of men and women who defied death to demonstrate a sense of fellowship with Jews and a realization of fascism as the common enemy of freedom-loving men of all races or creeds. Many of those who escaped from the continent did so through assistance given by Christians at the peril of their own lives.

In the Netherlands and Czechoslovakia, Christians put on the Jewish badges which the Jews were compelled to wear. In Rome, the chief rabbi of Italy was converted to Catholicism out of a sense of gratitude for succor given Jews during the years when Hitler had dominated the country.

During the war most of the resistance and underground movements conducted campaigns against anti-Semitism as important parts of their programs. At the end of the war it became known that so many Jewish children had been adopted into Christian homes and thus sheltered from the nazis that leaders among Jews were disturbed that many would be lost to their faith.

Aftereffects.—By 1946 the status of anti-Semitism was a moot question in practically every nation of the world in which Jews lived. One could make out a good case to show that it had increased. One could as easily make out as good a case to show that if it had increased, there had also been a corresponding increase of opposition to it and recognition of it as a problem which challenged all liberal men to find a solution lest some future demagogue use its corrosive powers to split men asunder, as Hitler had done.

There was no doubt that it had passed its peak in Europe. As nazidom crumbled, its satellites ran for cover and most of them officially repudiated their own versions of the Nuernberg laws. It was difficult to ascertain how deeply there had seeped into the populations the awareness of anti-Semitism as an undemocratic force. But governments were on record for equal treatment for Jews.

The general chaos of reconstruction left a wide divergence between such official pronouncements of governments which were in many instances still too feeble to enforce them and the actions of scattered elements of the populations. In addition the tug and pull of parties contending for control of the newly formed governments left the way open for some political aspirants to attempt to use anti-Semitism as a political tool, in the manner of Hitler. Such seems to have been the situation in Poland, for example, where pogroms were reported in the summer of 1946. Yet, despite these discouraging incidents, there was encouragement in the fact that the Polish government recognized the world's antipathy sufficiently to disclaim any connection with the attacks and to attempt to bring the attackers to speedy and stern justice. This was progress over a prewar Poland where anti-Semitism was a recognized and sanctioned policy of the state.

The reconstruction of the lives of Jews seemed to follow the general pattern of reconstruction in the Netherlands and Belgium and France, unimpeded by discrimination of a serious nature. Here and there, traces of the Hitler occupation could be seen. But in general, collaborationists were summarily dealt with.

The nations of central Europe were faced with serious and fundamental problems which might well determine the future of anti-Semitism in that part of Europe where it had long been most virulent. Czechoslovakia, for example, determined that it could no longer recognize national-minority groups. The new Czech government was to be built upon the system of individual rather than minority rights. This would necessitate an end to concepts of Jewish nationalism and segregation, in anything but religion; a dissolution of the old European form of a Jewish community, enjoying varying amounts of semiofficial recognition and autonomy. Into the United Nations charter, largely at the instigation of Jews, there had been written the promise of guarantees of individual human rights. The desire or ability of the infant United Nations to define and implement this promise would also have a bearing on anti-Semitism in the future.

This extension of systems of individual rights, supplanting systems based upon group or minority rights, was raising new aspects of the problem of anti-Semitism. A clear-cut distinction seemed in the making whereby on the one hand opposition to so-called "Jewish communities," *i.e.*, corporate Jewish life in matters other than religion, would have to be differentiated from discrimination against individual humans who were Jews. Even traditionally liberal and democratic governments like Czechoslovakia were pursuing policies designed to liquidate "nations within nations."

There was a young and fragile hope that the libertarian principles of the French Revolution might finally prevail in those parts of Europe where they had not penetrated in a century and a half. If they did, the problem of anti-Semitism would slowly be lessened but not until Jews responded to the criterion set down by the liberals of the first republic on the continent, "To the individual Jew everything; to the Jews as a nation, nothing."

Meanwhile, the insistence on Jewish "nationhood" and the rights of Jewish "nationhood" to political autonomy in a state of its own in Palestine, advanced by one segment of Jews known as Zionists, was creating anti-Semitism in a new part of the world. The Semitic Arabs were becoming vigorously and articulately anti-Zionist with the threat of becoming anti-Jewish in 1946. For the first time in history there were anti-Jewish riots in Cairo in the winter of 1945–46. There was danger then, that having passed its crest in Europe, anti-Semitism would find new life in the newly important near east.

In the U.S. there was unquestionably latent anti-Semitism. No leader had emerged to forge or attempt to forge the latent feeling into a movement. Meanwhile, the country was not unaware of the danger. The Ku Klux Klan (q.v.) anti-Semitic, anti-Catholic and anti-Negro organization of the 1920s, attempted a revival in 1945–46 and was met by vigorous legislative action depriving it of the right to a charter in several states. Legislation outlawing discrimination in employment opportunities was passed in an attempt to root out the economic causes of anti-Semitism.

But a not inconsiderable element in the status of anti-Semitism in 1946 was the attitude of Jews themselves. The impact of the dark decade upon their lives had been fearful. Many were discouraged with the process of

emancipation and the struggle for equality. They had been driven back upon themselves, and segregation and isolation seemed to predominate in most of their thinking and activity. They were drifting into the mediaeval pattern of a nation within the many nations in which they lived at the very time when the world was rejecting such social structures. Herein lay the possibilities of another vicious circle; of separation and withdrawal from society; of growing estrangement, suspicion, dislike of difference and violence, so that given an economic collapse, another war or any of the other major cataclysms which men so often had sought to escape by beating a scapegoat, a new wave of anti-Semitism would unleash furies that might surpass any the world had yet known.

* * *

In 1946 the chapter in the history of anti-Semitism that had begun in 1933, that had reached its peak from 1938-45, was still unfinished. The conclusion would depend upon what both Jews and Christians had learned in the ten years then passed. There was little doubt that many powerful forces of separateness, segregation and friction were left as part of the debris of war. The world could drift to another cataclysm in which anti-Semitism, nurtured by Hitler, would be fiercer and more widespread than ever. Or the world could build if both Jews and those of other faiths laid the ghost of Hitler along with his armies and, rising above exclusionary romanticisms of race and nation and "peoplehood," joined hands in an integrated effort to make the one world in which all lived a human reality which would square with the scientific and economic facts of mankind's new atomic age. (See also Civil Liberties; Fascism; Jewish Religious Life; JEWS, DISTRIBUTION OF; NATIONAL SOCIALISM; PSYCHO-LOGICAL WARFARE; ZIONISM.) (EL. Br.)

Antitank Guns

See Munitions of War.

Antitrust Law

See LAW.

Antonescu, Ion

Antonescu (1882–1946), Rumanian soldier and politician, was born June 2, 1882, in Transylvania. After service with the Rumanian armies in World War I he was military attaché in London and Rome, later rising to chief of the army's general staff and war minister. German demands on Rumania early in World War II led to serious internal disorders, and King Carol was compelled to offer the premiership to Antonescu, whose pro-nazi sentiments were well known. Upon taking office Sept. 5, 1940, Antonescu demanded Carol's abdication, established a totalitarian regime and ruled as an absolute dictator. Rumania soon became a German satellite and on June 22, 1941, joined in Germany's war against the soviet union. Antonescu assumed the title of generalissimo and commander of Rumanian armies in Bessarabia. During the soviet counterattack which penetrated Rumania in 1944 Antonescu was arrested by King Michael I, who had succeeded his father Carol to the throne, and in Sept. 1944, Antonescu and other Rumanians accused of active collaboration with the nazis, were turned over to soviet military authorities. After a ten-day trial in a Rumanian people's court, Antonescu and 12 of his associates were convicted May 17, 1946, on charges of war crimes and sentenced to death. He

Aosta, Duke of

Amedeo (1898–1942), duke of Aosta, Italian general, was born Oct. 21, 1898, in Turin, Italy, the son of Prince Emanuele Filiberto, duke of Aosta, and Princess Helen of France. The duke was a cousin of King Victor Emmanuel and was head of the house of Savoy-Aosta, second branch of the Italian royal family. At 17 he entered the army as a private in the artillery and saw active service at the front during World War I. He rose rapidly through the ranks, was decorated many times, and enjoyed wide popularity among all classes of Italians. A firm fascist, he was a close friend of Benito Mussolini. In 1937 he was named viceroy of Ethiopia, succeeding Marshal Rodolfo Graziani. During the period of British attacks on Ethiopia, 1940-41, he directed the Italian forces and won promotion to general of the Italian air force. In May 1941 the duke of Aosta, with a force of 7,000 surrendered to British troops at Amba Alagi after a long siege. He died while still a prisoner of war at Nairobi, Kenya, on March 3, 1942.

Appeasement Policy

See France; Italy; Great Britain and Northern Ireland, United Kingdom of.

Apples

See FRUIT.

Applied Chemistry

See CHEMISTRY.

Applied Psychology

See Psychology.

Apportionment, U.S. Congressional

See Census Data, U.S.

Appropriations and Expenditures

See Budgets, National.

Apricots

See FRUIT.

Aptitude Tests

See Psychology.

Aquariums

The years 1937-1946 were eventful for public aquariums. Not only were many of them closed or destroyed, but at least one major development from the standard assemblage of glass-fronted tanks was assayed. This was at the Marine Studios, St. Augustine, Fla., where two large pools were constructed to enclose segments of the ocean bottom and its immediate overlying water and the inhabitants thereof.

The basic difference between this and other institutions, aside from the size and situation of the viewing panels, at the sides and underneath the pools, was the attempt to carry in one large body of water from the nearby ocean numerous species of fishes usually antagonistic to each other or, at least, fishes which normally prey one upon the other, and to have the whole affair open to the sky.

Numerous technical difficulties appeared, including that of keeping such amounts of uncovered water at suitable temperatures. The normal efforts of certain fishes to live off other species of fishes entailed considerable replacement of specimens—replacements which could be effected in some locations but would be prohibitive in most others. This institution, depending entirely on admission fees for its maintenance, became a casualty when gasoline rationing restricted tourist traffic in 1942. It was re-opened in 1946 on a somewhat curtailed basis, only one tank being put into operation. All of the exhibits of this major development of fish exhibiting were of local origin.

Standard types of public aquariums throughout the world had a somewhat disastrous time during World War II. Not only were their sources of exhibition material cut to a minimum, or cut off entirely in many cases, but many of them either suffered severely from bombs or were closed as a measure of public safety, those in Europe suffering particularly. In the United States, most aquariums managed to keep open, although their exhibits became scant, and many species of fishes disappeared from their tanks entirely. This was particularly true of the marine specimens, collections of which were either prohibited or impossible to obtain.

One major institution was closed permanently—the New York aquarium housed in the old Castle Clinton, the Battery, New York city. The closure on Oct. 1, 1941, was declared necessary by the city, in order to provide for new construction in Battery park. It was not the oldest aquarium in the world, but it was certainly the most popular, more than 84,000,000 visitors having been entertained there in its 43 years of existence. Its collections were distributed among other public aquariums, returned to the ocean or planted in nearby fresh waters. The research activities conducted in the institution were carried on in accommodations loaned to the managers, the New York Zoological society, by sister institutions, and an interim exhibition was established in the New York Zoological park, pending the construction of a new building.

A small aquarium, specializing in local fresh-water species and in specimens from tropical fresh waters of the world was opened in Druid Hill park, Maryland, a joint venture of the Maryland Fish and Wildlife commission and the Baltimore Aquarium society.

Numerous cities projected plans for aquariums to be built as soon as practical after the war, both in the United States and in Europe, and it was of great interest to note that many of these were being planned either as adjuncts to marine research stations or as research stations per se, the exhibition of the fishes being subordinated to more serious work on the study of fishes and other marine organisms as a source of food and of the ocean as a source of the raw materials for industry. (C. W. C.)

Aqueducts

In the U.S. the Metropolitan aqueduct (241 miles) was constructed in 1943 to deliver Colorado river water, regulated by the bureau of reclamation's Boulder and Parker dams, to Los Angeles and 12 other California cities. This aqueduct, extending from Parker dam to Cajalco reservoir, 12 miles south of Riverside, Calif., was built at a cost of \$200,000,000 by the metropolitan water district, comprising these 13 municipalities. The capacity of the system was 1,000,000,000 gallons per day.

During 1945, the United States bureau of reclamation engineers prepared the designs and specifications for the 71-mi. San Diego aqueduct, under construction by the navy department in 1946, to deliver 50,000,000 gallons of Colorado river water daily to San Diego. The aqueduct was built to connect with the metropolitan water district's Colorado river aqueduct near San Jacinto, Riverside county, Calif., and to deliver water to the San Vicente

reservoir owned by the city of San Diego, and located approximately 16 mi. northeast of that city. Seven contracts were awarded for the construction of the aqueduct, involving the excavation of Poway, Fire Hill, San Vicente, Rainbow, Lilac, Red Mountain and Oat Hills tunnels and the laying of precast concrete pipe varying from 48 in. to 96 in. in diameter.

The 41-mi. Salt Lake aqueduct was also under construction by the bureau of reclamation on the Provo river project (Utah), to tap Deer Creek reservoir, located on the Provo river about 16 mi. northeast of Provo, Utah, and provide water for industrial and domestic purposes in Salt Lake City and, in addition, serve irrigation needs. This conduit, with a capacity of 150 sec.-ft. and comprised of tunnels, reaches of 69-in. inside diameter precast concrete pipe line and plate steel pipe line of various lengths, was approximately one-half complete in the fall of 1946.

The Olmstead tunnel, 6½ ft. in diameter and 3,600 ft. long, was completed in Nov. 1939 and the 3-mi. Alpine-Draper tunnel, also a part of the aqueduct, was completed in Nov. 1941. For the construction of the first 9-mi. section of this aqueduct, an aggregate processing plant was required near American Fork canyon, and a pipe-manufacturing plant was built at Pleasant Grove, Utah, by the contractor, the Utah Concrete Pipe company of Salt Lake City. Ten pipe units, 20 ft. long with a 69 in. inside diameter and 7½ in. wall thickness weighing approximately 20 tons each, could be manufactured daily at this pipe manufacturing plant.

Another water conductor on which construction was suspended during World War II by the bureau on the Provo river project, was the 6-mi. Duchesne tunnel, to divert water for irrigation purposes from the upper tributaries of the Duchesne river (Colorado river watershed) to the Provo river for storage in Deer Creek reservoir. The tunnel, located about 30 mi. northeast of Deer Creek reservoir, was designed for a capacity of 375 cu.ft. per second when unlined and a capacity of 600 sec.-ft. when lined with concrete. Approximately 9 ft. 3 in. in diameter, it required permanent steel rib liner supports and steel tunnel-liner plates in some places.

The first part of the Delaware river aqueduct system to supplement New York city's water supply was completed in the spring of 1944 when the delivery of water through the long tunnel from Roundout valley was begun. The completed aqueduct was to be 85 mi. long, and would supply the city with 540,000,000 gal. of water daily.

Previous to the completion of the initial stage of the aqueduct, New York city received its water supply, about 1,000,000,000 gal. daily, from the Croton and Catskill reservoirs, which eventually proved inadequate. The lack of precipitation on the existing watershed and the fact that its capacity had been reached several years before were primarily responsible for undertaking the construction of the Delaware river aqueduct system.

Work on the project was drastically curtailed during World War II because of lack of men and materials. As a result Merriman dam, which was to form Roundout reservoir, was not completed by the end of the decade; nor were the dams on the upper tributaries of the Delaware river which were to form the other two reservoirs in the system, the Neversink and East Delaware. The major part of the water supply was to be tunnelled through the aqueducts from these reservoirs.

Considerable aqueduct construction work was under way at the end of the decade 1937–46 on the bureau's

Colorado-Big Thompson project to deliver water from the western or Pacific slope of the Rocky mountains to the eastern side for supplemental irrigation of 615,000 ac. of land in northeastern Colorado. The 13-mi. Alva B. Adams tunnel, cutting through the backbone of the Rocky mountains from Grand lake, Colo., was the longest irrigation tunnel in the world at that time. It was completed early in 1946, and construction was begun on the 13-mi. Rams Horn and the 1.1-mi. Prospect Mountain tunnels, respectively 10 ft. and 121/2 ft. in diameter with capacities of 550 and 1,300 sec.-ft. respectively.

These two tunnels, together with the 1.3-mi. Aspen Creek siphon, a 10 ft. 9 in. diameter conduit connecting with the east end of the Alva B. Adams tunnel, formed a part of the power canal No. 1, terminating at the Estes Park

power plant near Estes Park, Colo.

The All-American canal, a part of the Boulder canyon project, tapped the Colorado river at Imperial dam downstream from Boulder dam. This 80-mi. canal, completed in 1940, served approximately 500,000 ac. of irrigable land in the Imperial valley of California, extending from Imperial dam down to the Mexico border line east of Yuma, Ariz., then along the U.S. side of this boundary line to the West Side Main canal west of Calexico, Calif. It became the largest man-made river in the world with an initial capacity of 15,155 sec.-ft.

The Coachella canal, a 145-mi. branch of the All-American canal system, was under construction by the bureau

The Colorado river aqueduct, a 241-mi. waterway supplying southern California. The photograph shows construction work as it neared completion on a giant intake manifold

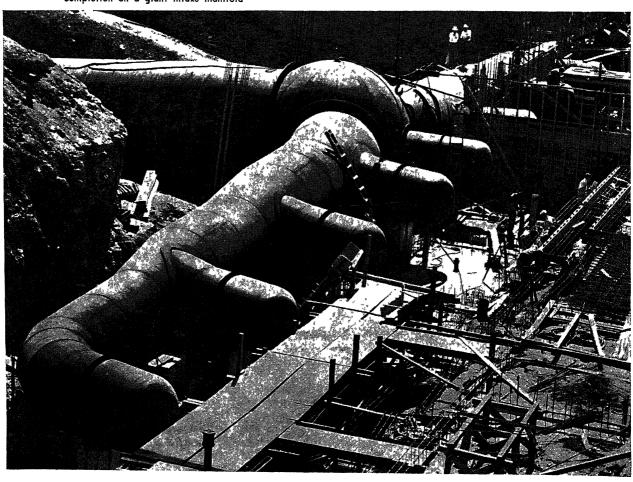
at the end of 1946 to serve irrigation needs of approximately 75,000 ac. of land in the Coachella valley of California. Branching from the All-American canal at a point approximately 18 mi. east of Yuma, Ariz., it was to extend northwest as far as Indio, Calif. Approximately 84 mi. of the Coachella canal had been completed in the fall of 1946, and work on 27 additional miles was progressing. This canal, designed for an initial capacity of 2,500 sec.-ft., was 60 ft. wide at the bottom, 124 ft. wide at the top and approximately 16 ft. deep at the taking-off point from the All-American canal.

The canal system of the multimillion acre Central valley project under construction by the bureau of reclamation in California was to consist of the Madera canal, the Friant-Kern canal, the Contra Costa canal, the Delta Cross channel and the Delta Mendota canal.

The 37-mi. Madera canal was completed in June 1945. Construction work on the 156-mi. Friant Kern from Friant dam to Bakersfield, Calif., was started in Aug. 1945. These two large gravity canals were designed to carry water from Millerton lake, storage reservoir created by Friant dam, to the fertile San Joaquin valley. The first water was delivered through the Madera canal in 1944, with a capacity of 1,000 sec.-ft. The Friant-Kern canal was designed for a capacity of 4,000 sec.-ft.

The 47-mi. Contra Costa canal was almost completed in 1946. Industries in the Antioch-Pittsburg area of the Delta region of Central valley were provided with water by means of this system during 1944. The canal had a capacity of 350 cu.ft. of water per second.

The 120-mi. Delta Mendota canal, with a diversion capacity of 4,600 sec.-ft., was planned to transport the



water along the west side of the San Joaquin valley to Mendota pool. Initial construction was a 12.9-mi. section near Patterson, Calif. The 50-mi. Delta Cross channel was scheduled for construction on the Central valley project, with 8,000 to 10,000 sec.-ft. diversion capacity, to carry Sacramento river water to the San Joaquin river.

In the decade 1937-46 the bureau of reclamation built 591 mi. of canals. Under construction at the end of the decade were several large tunnels and canals designed for the irrigation systems of the Columbia basin project (Washington). These vast waterways would ultimately transport water stored by Grand Coulee dam to 1,000,000 ac. of land.

The 2-mi. Bacon tunnel and the 1,020 ft. Bacon siphon, both 23 ft. in diameter, were under construction in 1946. Work was also progressing on sections of the Columbia basin main canal, with a carrying capacity of 9,700 sec.-ft. of water. The portions of the canal under construction varied in width from 95 ft. to 200 ft. at the top of embankments and were from 20 ft. to 48 ft. deep. This work was located between Grand Coulee dam and Ephrata in central Washington.

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World Developments.—The continued advance in tunnel-driving methods, through improved mechanization, accelerated new developments in aqueduct design during the decade. Formerly, mountain obstacles were circumvented by longer pipe lines, or channels, where later the direct route by tunnel was not only feasible, but also more economical, provided that the desired cross section for water carriage was large enough to satisfy the economic requirements of tunnel driving (i.e., in hard rock, not less than 8 ft. wide by 6 ft. high, or, in soft materials, such as clay, *7 ft. diameter.)

Tests clearly showed the advantage of lining rock tunnels with concrete, to reduce frictional losses and thus enable tunnels and channels to be constructed with small gradients of as little as 1 in 3,000. An aqueduct of this gradient, and with a water section of 50 sq.ft., could deliver more than 100,000,000 U.S. gal. per day, compared with less than 50% of this flow for a similar, but unlined tunnel. Prior to 1939, German engineers experimented with permanent smooth synthetic linings of the vinyl resin group, but concrete, poured in situ against removable steel shuttering, had yet to find an economic rival. The Mardale tunnel, five mi. long, of the Manchester (England) Haweswater scheme, was a first-class example of an efficient concrete lining, the surface being glasssmooth. For gravity-flow tunnels, built through durable rock, some economy of construction was effected by omitting the normal, but highly expensive roof lining (with which the water was not in contact). For the transport of acid waters from peat-bearing gathering areas, or through sulphate-bearing rocks, aluminous cement-concrete was used, to inhibit attack, which could eventually weaken ordinary concrete linings, increase its surface rugosity and thereby reduce its efficiency. Following the damage to the unreinforced concrete lining caused by water pressure of 540 ft. head during the final test of the Sydney pressure tunnel some engineers returned to the conservative policy of limiting pressure tunnels to those areas where the imaginary free earth pressure above the tunnel was at least equal to the water pressure within the tunnel. This assumption, however safe, ignored the great variety in geology that the resistance of a large number of hard rocks to rupture is many times their superincumbent load, while, beyond a certain depth in some clays (e.g., London, Eng.), their equivalent fluid pressures remain constant, irrespective of their distance below the surface.

The location of aqueducts, through improved site investigation, both geological and geophysical, merited more attention than before in the years 1937–46; in the Lochaber (Scotland) scheme of 1937 a 15-mi. tunnel was preferred to a shorter, straight tunnel, in order to follow an angular course within the mountain, parallel to the nearest surface contour, both to facilitate construction, via many short adits (i.e., horizontal branch tunnels to the surface) and to collect water from neighbouring streams. This procedure was then considered in water supply practice, in order to supply intermediate towns which would normally be separated from a straight aqueduct in tunnel by the intervening lateral obstacle of mountain.

Channels.—Aqueducts in channel, constructed at a flat gradient consistent with obtaining an economical section, are confined to situations where the normal fall of the ground has a gradient similar to that required for the intended water flow. Otherwise, in water supply, where water itself is more prized than its potential energy, covered channels were more common than in hydroelectric development, both for pollution protection, their reduced risks of failure in operation and reduced losses through leakage, compared with pressure aqueducts. At Umtali in Rhodesia great economy was claimed in the use of precast concrete channels; at Lashkar city, Gwalior, India, "gunite" lining was used.

Pipe Lines.—Pressure pipe lines, though more costly than channels, are of more numerous variety, in cast iron, steel, reinforced concrete and prestressed concrete. Cast iron, the traditional material, was subject to internal corrosion which rapidly reduced its effective flow capacity. The increased rugosity of the pipe lining was the principal cause of the reduction in flow. Some unprotected cast iron pipe lines had, however, been in operation more, than 100 years, made possible by regular rehabilitation. Thin concrete linings up to 1 in. thickness to cast iron pipes re-popularized this metal for mains up to 48 in. diameter. Operational pressures were extended beyond 800 ft. head by the occasional use of high duty metal of superior strength, but, normally, beyond this limit, steel had to be used.

Steel pipes, protected with bitumen lining and protective wrapping, were the subject of conflicting expert opinion as to the long-term efficacy of the bitumen protection which, in some cases, suffered embrittlement with age, thereby exposing the metal to rapid attack. Early examples, however, of unprotected steel mains had given more than 40 years' service before requiring replacement. For high-pressure operations, more common to hydroelectric development, steel, owing to its greater strength, was the only possible medium, but, in practice, it was frequently limited by welding technique to 1 in. metal thickness. For low-pressure work, the earliest tendency to employ thin shells of metal thickness less than onehundredth of the diameter gave way to thicker shells, or stiffening by internal concrete linings, through the knowledge that corrosion was accentuated by flexing of thin plates. Moreover, it was found that corrosion intensified at the bottom of the pipe, where the trench in which it rested tended to act as a natural drain. In Australia, where 23 mi. of 68 in. diameter aqueduct were being laid in 1946 for the Victoria water supply from Sylvan dam, steel was generally preferred. In South Africa, by way of comparison, this preference appeared to be less marked,

cast iron being employed at all submerged river-crossings, where corrosion was likely to be more intense than elsewhere. As an alternative to bitumen lining, concrete linings to steel tubes were used by many authorities, but one (Capetown, South Africa), had to undergo scraping to remove internal growths. The highest recorded waterhead on any aqueduct remained at about 5,700 ft. on the welded steel pipe line of the Rhône hydroelectric scheme. For medium heads, an advance on this practice was the adoption of thin steel shells, reinforced with a helix of steel bar, encased in concrete. Originally, this was featured in the "Bonna" pipe, commonly used in Europe, but only in later years was a satisfactory joint developed. With low-pressure aqueducts, where the waterhead does not exceed about 150 ft., reinforced concrete was the medium, but it was seldom possible to utilize the steel economically because, even at low stress, the surrounding concrete tended to crack. On large diameter pipe lines, where the internal pressure varied considerably between the top and bottom of the pipe, the economic section adopted was that of a flattened circle, so proportioned as to produce uniform circumferential stress, as in the Galloway (Scotland) hydroelectrical development of 1938. Such stress analysis is similar to the determination of the shape of a drop of water supported on a horizontal plane.

Extensive research was undertaken on prestressed concrete pipes, which originated in France and which comprised a concrete shell, compressed circumferentially by a coil of steel wire within the concrete, in a similar manner to the prestressing of early gunbarrels. Owing to the higher working stress of hard-drawn wire compared with steel (80,000 lb. per sq.in. as against 18,000 lb. per sq.in.) the quantity of metal required was only about one-fifth that of mild steel. The prestressing was so adjusted that the concrete shell remained in compression when the pipe was under internal pressure, thus preventing both fracture of the concrete and the exposure of the reinforcement to corrosion. This type of pipe line was expected to rival existing types for diameters greater than 24 in., and, in particular, for those operating under medium pressure.

Operation.—Operational considerations forced detailed attention to the charging of pressure aqueducts and the proper placing and sufficiency of improved types of air valves at summits and along rising gradients, to expedite the removal of air. To facilitate the dewatering and recharging of these aqueducts many authorities insisted on the complete elimination of level grades where both water and air might collect, and the provision of more inspection manholes at intervals, in some cases of 1,000 ft. In Europe probably more than elsewhere, when new aqueduct construction ceased during World War II, other ways had to be found to increase the efficiency of existing works. This brought about a relatively new study of the problem of economic operation toward higher flow capacities. For the renewal of peat deposit which restricted flows, brush-scraping, which did not expose the metal to attack, proved in some instances so efficient that it became a yearly practice.

In long aqueducts, consisting of many gravity and pressure parts, restrictions on one section were overcome to raise the flow of the whole. But it was generally found that aqueduct design in the past had not allowed sufficiently for the peak load which was required on occasions. From this water supply experience, certain facts emerged: that the flexibility of peacetime operation generally demanded either a potential capacity at least 50%

greater than the calculated mean supply from the reservoir, or the provision of potential means for mechanically boosting the flow.

In some countries afflicted by World War II, the advantage of standard pipes and fittings, where possible, for aqueducts was more obvious than elsewhere. The metropolitan water board (London) wisely planned new development in twin 48 in. pipes, to be laid at 20-year intervals along different routes, and interchangeable with existing stock, in place of the original program of a single nonstandard, but larger diameter line.

Although the traditional method of crossing rivers still remained popular, either by a pressure aqueduct below the bed of a river (where it was difficult to dewater and repair the aqueduct) or by a pipe supported on a bridge, self-supporting pipe-bridges, principally in steel with welded joints, were also developed. Their greater economy lay in the redundancy of the independent bridge to support the pipes which, if suitably designed, were capable of supporting themselves. The additional thickness of steel required to bridge quite large spans was of small cost, and the reduction in size of foundations and abutments was proved economic in low-bearing soils. A multiple-span bridge of 48 in. diameter, operating at 500 ft. head, and up to 90 ft. spans, required only an additional metal thickness of about 1/4 in. Self-supporting pipe arch bridges were also constructed in cast iron, but the air valve at the crown, their angular shape, difficulty of access and lack of structural beauty retarded their development. The long but small diameter catenary bridge in Japan, where the wire rope carried the contiguous pipe-load, was further indication of possible future development. (See also Canals and Inland Waterways; DAMS; TUNNELS.)

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See AGRICULTURAL RESEARCH ADMINISTRATION.

Arabia

A peninsula of c. 923,600 sq.mi., with an estimated pop. of 10,084,000, Arabia consists politically of two independent Arab states (Saudi Arabia and Yemen), of the nominally independent sultanate of Oman and Muscat (Masqat), of the territories of Trucial Sheikhdoms of Oman and Qatar (British protectorates), of a nominally independent sheikhdom of Kuwait and of the colony and protectorate of Aden (q.v.).

Saudi Arabia.—An independent kingdom formed by the union of the Sultanate of Nejd and of the kingdom of



President Roosevelt en route from the Yalta conference, entertained King Ibn Sa'ud aboard a U.S. destroyer in Great Bitter lake near Cairo, Feb. 20, 1945. The king's 800-mile journey marked a first departure from Arabian soil

Hejaz under the Ibn Sa'ud dynasty (1926) and by the incorporation of the former principality of Asir (1934). Respective areas: Nejd 413,800 sq.mi.; Hejaz 182,200 sq.mi.; Asir 13,900 sq.mi.; total 609,900 sq.mi., about 66% of the Arabian peninsula. The population of Nejd (no census taken) was estimated at 3,000,000, that of Hejaz at 1,500,000 and that of Asir at 750,000; total 5,250,000 (about 52% of the population of the peninsula). The people are Bedouin nomads in transition to the civic life of communal organization; they speak Arabic and are ardent Mohammedans still under the influence of the Wahhabi revival of 1913–26. Saudi Arabia had still two capitals: one in Hejaz–Mecca (pop. 80,000) and another in Nejd–Riyadh (30,000). Other chief towns: Jidda (40,000), Medina (30,000), Hofuf (30,000) and Sabiya (capital of Asir, 20,000).

The ruler of Saudi Arabia throughout the decade 1937—46 was Abdul-Aziz ibn Abdurrahman al-Faisal al-Sa'ud (b. 1880) who in 1927 assumed the title of "King of the Hejaz and of Nejd and its dependencies." Eldest of the king's 32 sons, Emir Sa'ud (b. 1905), who was formally declared heir apparent on June 15, 1933, resided in Nejd and exercised there the functions of viceroy. The second son, Emir Faisal (b. 1907), acted as viceroy in Hejaz in his father's absence; according to the constitution issued on Aug. 29, 1926, he also presided over a council of ministers and acted, as the foreign minister of the kingdom.

The frontiers of Saudi Arabia were more or less defined with Iraq, Kuwait and Trans-Jordan in the north and with Yemen in the south; Ibn Sa'ud, however, did not recognize the annexation of Aqaba and Ma'an to Trans-Jordan. They were rather indefinite with the territory of the Trucial Sheikhs of Oman and with the sultanate of Oman and Muscat in the west and with the Aden protectorate in the south; but that part of Saudi Arabia is the uninhabited desert of Rub' al Khali. (X.)

* * *

The kingdom of Saudi Arabia, constituted in 1933 by

the union of the two kingdoms of the Hejaz and Nejd under the single banner of the house of Sa'ud, was indeed fortunate in that, during the period immediately preceding the decade of world-wide tragedy covered by this review, it was able to prepare for the coming storm by the effective stabilization of its economic and political foundations with the result that, by the grace of God and with the help of old and new friends in Great Britain and the United States of America, Arabia not only came unscathed out of the furnace of war but actually prospered greatly in the midst of almost universal havoc and desolation.

In the year 1933, the succession to the throne of Saudi Arabia was formally secured by the public acclamation of H.R.H. the Emir Sa'ud as crown prince and heir apparent. In the same year a concession was granted by the government to the Standard Oil Company of California for the exploration and exploitation of the oil resources of the eastern provinces of the kingdom, while at about the same time a similar concession was negotiated with an Anglo-American syndicate for the development of an ancient gold mine at Mahd al Dhahab in the Hejaz mountains. The following year witnessed the final settlement, after a brief but successful campaign, of a long drawn-out frontier dispute between the sister kingdoms of Saudi Arabia and the Yemen, whose political relations were placed on a satisfactory basis of friendship by the delimitation and demarcation of a mutually acceptable boundary.

The relations of Saudi Arabia with its neighbours were further improved in 1936 by the inception of full diplomatic relations with the kingdom of Egypt with the now obsolete ceremony of the "holy carpet," which in former times used to accompany the Egyptian pilgrimage to Mecca. The resumption of friendly relations resulted immediately in the generous co-operation of the Egyptian government with the government of Saudi Arabia in a number of beneficial schemes for the improvement of the amenities of the holy land of the Hejaz, including muchneeded repairs to the prophet's mosque at Medina and the improvement of the pilgrim road from Jidda to Mecca and 'Arafāt. In the following years, the two governments further co-operated in the survey and realignment of the

road from Jidda to Medina, and also in the consideration of various schemes for the re-organization of the water supply and lighting systems of Mecca. And the cordial relations between the two countries were finally consummated in 1945 and 1946 by an exchange of state visits by their monarchs, which captured the public imagination of all the countries of the Arab world and did much to reinforce the spirit of unity and co-operation which had already, in 1945, served to draw the Arab countries closer together within the framework of the Arab league (q.v.).

With the stabilization of the economic and political situation in Saudi Arabia and, above all, the actual discovery of oil at Dhahran and the gold-mining operations, the country seemed well set for a long period of uninterrupted prosperity and progress when, in 1939, the outbreak of World War II and the consequent restriction of shipping facilities to the Arabian ports seemed to presage a period of stagnation, if not disaster, in a land so largely dependent on the import of many essential commodities, including foodstuffs and piece goods, motor vehicles and machinery. At the same time the pilgrim traffic, which had hitherto been the principal source of the country's revenue, began to decline and later came to a complete stop owing to the entry of Italy into the war and the consequent dangers of navigation in the Red sea area. Furthermore, the Allied Powers had found it necessary to impose severe limitations on the production of oil in the middle east with the result that the promising progress already made in actual production in the Hasa province had to be suspended until the last year of the war, when production was resumed on a satisfactory basis. It is sufficient to say that, as compared with about 30,000 tons of oil in 1939, no less than 3,000,000 tons were produced in 1945, while the estimate for production in 1946 was more than double that figure and still further increases were anticipated as the result of arrangements negotiated during the war years for the construction of a 1,200-mi. pipe line from the Hasa oil fields to the Mediterranean.

On the outbreak of war in 1939, the Saudi Arabian government adopted an attitude of de facto neutrality but refrained from making any formal announcement on the subject. At the same time it maintained a friendly and sympathetic attitude toward the Allied cause, while Britain and, later, the United States cordially reciprocated that attitude by making substantial contributions toward the maintenance of economic stability in Saudi Arabia, whose principal sources of revenue had been completely cut off by Allied wartime policy. By these means, and owing to the foresight shown by the Arabian government in laying in considerable stocks of all necessary commodities before the war, the economic crisis was successfully tided over until the Allied victories, first over Italy and later over the other axis powers, enabled the country to resume its longinterrupted progress under more normal conditions.

Meanwhile the Saudi Arabian government had to cope with a somewhat complicated political situation arising out of war conditions. The German minister, who happened to be absent from Jidda at the outbreak of war, was not encouraged to return; and German interests were looked after by the Italian legation until the entry of Italy into the war. For some time after this event the Italian legation continued to function, but circumstances ultimately compelled it to close down; and the Italian community at Jidda was segregated in its own interests in one of the quarantine islands. The crews of some Italian destroyers which were compelled to take refuge in Arabian terri-

torial waters were duly interned on the island of Jaziva Sa'd, whence the sick were transferred to a camp near Taif. A further complication was provided by the French legation, where the minister remained faithful to the Vichy government until the end, while after the Allied capture of Syria a Free French representative of ministerial rank was permitted to take up residence at Jidda in the interests of General de Gaulle.

The interest of the United States in Arabian oil and the subsequent entry of that country into the war as a principal Allied Power resulted naturally in the expansion of American diplomatic and other contacts with the Saudi Arabian government. These contacts led progressively to the conception of a number of important enterprises in connection with agricultural and economic development. Many deep wells were bored in the desert to improve the country's water supply, while a team of expert farmers from Arizona in due course came in to supervise a spectacular and successful agricultural experiment in the Kharj province, where several thousands of acres of desert were brought under cultivation to supply Riyadh, the capital, with vegetables and grain. The country also benefited greatly by its inclusion within the scope of the Allied Lend-Lease program, with the result that by the time the war came to an end Saudi Arabia was in the fortunate position of finding itself in almost as favourable economic and administrative circumstances as it would have achieved in the normal course of the development planned before the war, had those plans not been interrupted by events over which the government had no control. Inevitably, owing to the difficulty of securing supplies from abroad in adequate quantities, the prices of all commodities tended to rise steeply to the disadvantage of the poorer classes; and their position was still further worsened by the seasonal recurrence of a locust epidemic during the years 1944 to 1946. A mission sent to Arabia by the International Locust commission failed to check this epidemic because of a lack of necessary equipment and of experience of local conditions.

The resultant problems of scarcity and high prices, however, were tackled resolutely by the government, which promptly issued a free bread ration to the whole population of Mecca, Medina and other towns, while an extensive development program was undertaken to procure work and wages for the agricultural population rendered unemployed by the ravages of the locusts. Moreover, the government made arrangements to ensure the requirements of consumers in the matter of foodstuffs until the war crisis ended; and the country was perhaps in a more prosperous condition than its neighbours.

By way of reciprocation for the material assistance rendered to the country by the Allies the Saudi Arabian government helped the Allied cause substantially by exercising a pacific and restraining influence in the whole Arab world and by counselling patience amid the difficulties and troubles which beset many of the Arab countries during this period, particularly in Palestine and in Iraq and Syria; both the latter had the misfortune of being caught in the vortex of war. At the same time, the Saudi Arabian government played a prominent part in championing the aspirations of all the neighbouring Arab countries toward independence, while its adhesion to the project of an Arab league substantially increased the prestige of that institution when it was ultimately formed in March 1945.

The important part played by the Saudi Arabian government in the middle east during the critical years of the war received formal recognition in Britain and the United States when those two powers invited it and the other

Arab states to declare war on Germany and thus be able to be represented at the San Francisco conference. All these states in due course became original members of the United Nations. But this development had been preceded in Feb. 1945 by a visit by H.M. the king of Saudi Arabia to Egyptian territory and his historic meetings with President Roosevelt and Prime Minister Churchill, with both of whom all the problems of the Arab world were discussed in an atmosphere of cordiality and good will. It was on this occasion that Churchill greeted his majesty as one who had proved himself a good friend in time of need to Britain and its Allies, while Roosevelt gave through his majesty to the Arab world a solemn assurance that the Arab attitude towards the Palestine problem would receive the sympathetic support of the United States government. The sudden death of the president only a month after this meeting was therefore widely regarded by the Arab peoples everywhere as a grave blow to their essential interests; but the relations of Saudi Arabia with its two great Allies continued to be cordial in the extreme. During the postwar period, the Arabian government continued, in spite of certain disappointing developments in the international field and particularly in the middle east, to show its confidence in the Great Powers by practising and counselling restraint and patience pending the consideration and settlement of all the political problems involved.

Meanwhile, the Saudi Arabian government faced the immediate future with confidence in the knowledge that in a world at peace, its own economic resources would be sufficient to guarantee the accomplishment of the many schemes of development which had been planned in detail during the war years when circumstances made it impossible to proceed with their execution. The resumption of the Meccan pilgrimage and the development of the country's oil resources promised to ensure financial stability, while the comprehensive review and revision undertaken during 1946 of the administrative and fiscal system of Saudi Arabia would enable the government to make the best and most economical use of its ever-increasing resources for the benefit of all the people committed to its charge. The government continued to play its proper part in international affairs as a member of the United Nations and a member of the Arab league. (I. Sp.)

Yemen.—An independent kingdom in the southwestern corner of the Arabian peninsula. Area: c. 75,000 sq.mi.; pop. (estimate): 3,500,000. Chief towns: San'a (capital) (25.000), Hodeida (15,000). In the north the boundary between Yemen and Saudi Arabia was defined by the treaty of May 20, 1934. In the south the boundary between Yemen and the Aden protectorate was fixed by the Treaty of San'a of Feb. 11, 1934. Ruler: King Zaidi Imam Yahya ben Muhammed ben Hamid ed Din.

Oman and Muscat.—A nominally independent sultanate situated in the eastern corner of the Arabian peninsula. Area: c. 82,000 sq.mi.; pop.: (1937 est.) 500,000, mainly Arabs, but there is a strong infusion of Negro blood. Chief towns: Muscat or Masqat (capital) (4,200), Matrah (8,500). Ruler: Sultan Sayyid Sa'id ibn-Taimur.

Trucial Sheikhdoms.—A galaxy of eight small Arab states extending from Khor Khalba, on the Gulf of Oman (90 mi. S. of Ras Musandam) to a point about 50 mi. W. of Qatar peninsula in the Persian gulf. Area: c. 41,800 sq.mi.; pop.: 120,000. Under the treaty of March 1892 (Nov. 1916 in the case of Qatar) the sheikhs, on behalf of themselves, their heirs and successors, undertook that they would on no account enter into any agreement or correspondence with any power other than Great Britain.

Kuwait.-A nominally independent sheikhdom on the

coast of the Persian gulf between the territories of Saudi Arabia and Iraq. Area: 1,930 sq.mi.; pop.: 50,000. Ruler: Sheikh Ahmad ibn-Jabir as-Subah.

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Item												Value (000's omitted)	Amount or Number
Exchange rate	•	: :		٠	•	٠		•	٠	•	٠	£1 = \$4.889	
Transportation Highways													874 mi.
Communication Telegraph lines													1,525 mi.
Minerals Petroleum													495,000 ьы.*
*5,365,000 bbl. in 194	٥.											*	

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Arab League

The Arabs, one of the oldest races in the world, are distinguished by having permanently influenced the history and development of the near and middle east for more than 4,000 years.

Arabization.—Before the Christian era the Arabs were steadily infiltrating into the fertile crescent and the Nile valley, as settlers, traders, graziers, raiders and invading conquerors. All ancient builders of civilization in Babylon, Egypt, Nineveh, Damascus, Palmyra, Patras, Phoenicia (Tyre) and Carthage, had close racial and linguistic affinities with the original Arab stock. These affinities between the nomadic Arabs and their kin—Assyrians, Chaldeans, Arameans, Phoenicians, Carthaginians, Hyksos, Hebrews and others—must be borne in mind in considering the Arabization of a vast territory embracing western Asia and north and east Africa—the actual domain of the Arab league.

The modern Arab is the product of this continuous fusion and assimilation of related races with successive waves of emigrant Arabs resulting from the great religious, cultural and political Arab movement of the 7th century.

Under the inspiration of the Prophet Mohammed, the Arabs became united and, under the banner of Islam, carried their mission in every direction with unprecedented success. Before Mohammed, Arab unity was nonexistent. The Arab social and political structure was based on tribal patriotism. The Arab prophet and his ideas, recorded in the sacred Koran and the Hadith, transformed Arab society from a basis of fratricide clans and feudal states into a fraternal, broad-minded, tolerant international society capable of dominating vast areas from China to France during many centuries and successfully linking the older Greek and Roman civilizations with western ideas and culture. The golden era of Arab rule in the east and west, remarkable for its stimulating progress in many spheres, left behind an imperishable legacy in literature, architecture, science and the arts as well as a great Arab nation stretching from the Indian ocean to the Atlantic.

Movement for Unity.—The modern movement that produced the Arab league was a new phase in the annals of this ancient people. After the fall of their empires the Arabs had aspired to federation. Sharply conscious of the blessings of unity, they constantly manifested their



Arab league officials meeting at Bludan, Syria, in 1946, reaffirmed their opposition to further immigration into Palestine. The league was formed in 1945

aspirations in revolts, literature, songs, mass meetings, demonstrations and political action.

The beginning of the decade 1937–46 witnessed the inauguration of a number of pan-Arab organizations. These included the Inter-Parliamentary Arab conference (Cairo), Oct. 15, 1938, the Arab Students' conference (Cairo), Nov. 6, 1938, the Arab Women's conference on Palestine (Cairo), Oct. 15, 1938, and the Arab Medical conference (Baghdad), Feb. 9, 1938. Similar conferences, arranged regularly under the auspices of official bodies, continued to bring together Arab engineers, lawyers, pharmacists and members of other professions.

The inauguration of these pan-Arab international gatherings helped lay the foundations for the Arab league, comprising the seven states of Egypt, Iraq, Syria, Lebanon, Saudi Arabia, Trans-Jordan and Yemen.

The London Conference on Palestine, which opened at St. James's palace, Feb. 7, 1939, was a notable landmark. For the first time in modern Arab history, the independent Arab states participated in an international gathering as a united body, recognized as such.

Warring Powers and Arab Unity.—The outbreak of World War II quickened the powerful axis radio campaign aimed at securing Arab goodwill by declarations in support of Arab unity and independence. The dangerous possibilities of this campaign were quickly recognized by Great Britain. British sympathy toward the Arab renaissance had proved an important military factor in World War I. Now, again, Britain demonstrated her realization of the value of Arab friendship. Foreign Secretary Anthony Eden, in his momentous Mansion House speech, pledged Britain's full support for any Arab scheme to secure a greater degree of Arab unity:

The Arab World has made great strides since the settlement reached at the end of the last war and many Arab thinkers desire, for the Arab peoples, a greater degree of unity than they now enjoy. In reaching out towards this unity they hope for our support. No such appeal from our friends should go unanswered. It seems to me both natural and right that the cultural and economic ties, too, should be strengthened. His

Majesty's Government, for their part, will give their full support to any scheme that commands general approval.

First Arab reaction to the competing British and axis offers was noncommittal. Arab faith in imperialist fascist Italy was weak. Italy's mare nostium policy was suspect. On the other hand, Arab experience with Britain and France discouraged any enthusiastic reaction to Eden's declaration. Promises made to the Arabs in World War I had not been honoured. The outcome and effects of British and French policy at Versailles regarding Palestine, Syria, Lebanon and Iraq had caused disappointment in the Arab world.

In the absence of a positive Arab reaction, Britain renewed her approach in the form of a declaration by Anthony Eden, made in the house of commons on Feb. 24, 1943.

As I have already made plain, the British Government would view with sympathy any movement among the Arabs to promote economic, cultural or political unity, but clearly the initiative in any scheme would have to come from the Arabs themselves. So far as I am aware no such scheme which commands general approval has yet been worked out.

Beginnings of the League.—Arab governments and outstanding Arab personalities now responded and proposed an Arab conference. The Egyptian government formally took the initiative, and after long consultations between Arab states the Alexandria protocol was signed on Oct. 8, 1944, laying the foundations of the Arab league.

Saudi Arabia and Yemen at first declined to sign the protocol. King Farouk I of Egypt, accompanied by Abdul Rahman Azzam Pasha, later secretary-general of the Arab league, visited Saudi Arabia for the famous meeting of the two kings at Radwa, in Hejaz, following which the adhesion of Saudi Arabia and the Yemen was secured. Thenceforward King Farouk threw all his influence into the swift creation of the Arab bloc. In Feb. 1945 the official delegates of the seven Arab states met in Cairo to negotiate and sign a pact binding them in an Arab league. It was signed on March 22, 1945, amid the acclamation of the whole Arab world. An official celebration was held at Zafaran palace, Cairo.

Nonrigid Pact.—The pact was elastic in form, affording the signatory states full discretion to accept or reject any majority decision. That provision (originally severely criticized) proved in practice to be a source of strength rather than weakness. The will for federal unity proved to be in advance of the letter of the pact, and Arab public opinion, similarly, was ahead of the Arab governments. The elasticity of the pact helped achieve the peoples' aspirations without friction, and the league itself developed as the British constitution developed—unwritten, yet formidable, adaptable, permanent and capable of continuous extension.

The league pact paved the way for the member states to develop and interrelate their culture. economy and social exchanges for their common good.

In the first ordinary meeting of the league council (Nov. 27, 1945), a cultural treaty was introduced providing the basis for common education and embracing a wide degree of collaboration in science, art, museums, literature, text-books, educational organizations and institutions.

Although the pact did not constitute a defensive alliance, the events occurring in Syria and Lebanon in May-June 1945 demonstrated the Arab states' willingness to accept responsibilities for mutual support which, in practice, amounted to the strongest obligations of mutual defense.

In the international field the league became an instrument of peace. War between member states became absolutely illegal and forbidden under all circumstances. Disputes had to be settled by arbitration. As a peaceful, co-operative institution serving the Arab world, the league extended its services to wider spheres and mediated, for example, in differences arising between Saudi Arabia and Iran. It declared its willingness to affiliate with comparable international bodies, especially the United Nations. Although the league preceded the United Nations, its pact (article 3) provided for full international co-operation with appropriate institutions in politics, economics and social affairs.

The league organization comprized three bodies: (1) the council (in which all member states were equally represented); (2) the secretariat, an administrative and diplomatic agency; and (3) the committees covering culture, economy, legal questions, agriculture, commerce, transport, social affairs, etc. These committees were organized to produce drafts for treaties, agreements or recommendations to be implemented by the council which were to become binding upon all member states electing to adhere to them.

The league's activities were not restricted to member states. The council was charged by Annex II with guarding the interests of all Arab countries and communities not then members of the league; with encouraging their development and eventual independence.

Arab countries automatically were to become eligible for full membership on attaining independence. Although unrepresented in the council, they could be represented in all committees by council nomination. Thus the league rallied Arab forces for freedom and self-determination, and for economic, cultural and social co-operation throughout the Arab-speaking world. The Spanish zone in Morocco (with the approval of the Spanish government) sent delegations to various committees. It was hoped that Britain and France would follow this lead, thus eventually securing representation for every Arab country irrespective of its political status.

Palestine.—Palestine, though it remained a nonindependent country, was nominally represented in the council,

as provided in Annex I on Palestine. Yet 20,000,000 Arabs in Tunisia, Algeria, Morocco and Tripoli could not be represented in the council and had to limit their participation to committees, pending their attainment of complete independence.

The Palestine issue, virtually a clash between the aspirations of two differing races and religions, absorbed and diverted an enormous proportion of the energies of the league making, out of Palestine's special circumstances, an exceptional case.

League's Mission.—The Arab league's mission and purpose were clearly expressed in the text of the pact, the council's resolutions, the committee meetings of Arab foreign ministers and the public declarations of the league's secretary-general. It excluded racial discrimination by its formal definition of an "Arab" as "one who settles in Arab countries, speaks Arab language and shares Arab sentiment." His racial origin, whether Nordic or Mongolian, was immaterial.

Other tenets of the league were: (1) complete religious tolerance; Christians, Jews, Moslems and others were conceived of as absolutely equal citizens in an Arab state, enjoying the assured right to practise their faith freely; (2) freedom, equality and self-determination for all people, irrespective of race, creed or colour; (3) denunciation of war, for whatever reason, as unjustifiable; peace was the permanent objective; (4) co-operation in a free world, thrown open and developed for the common welfare of mankind; (5) complete support for all international institutions devoted to establishing permanent peace and world justice.

The Arab league, backed by the individual Arab states and the public opinion of 70,000,000 Arab-speaking people, stood for these basic principles. By their unanimous resolution at Alexandria (Aug. 13, 1946) the Arab states foreign ministers pledged Arab support in all just causes brought before United Nations, irrespective of other circumstances.

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Arbitration, International

See International Court of Justice; Permanent Court of International Justice.

Arboretums

See BOTANICAL GARDENS.

Arce y Ochotorena, Emanuel

Cardinal Arce y Ochotorena (1879-), Spanish prelate, was born Aug. 18, 1879, in Ororbia, Navarre province. Educated in the Pamplona and Zaragoza seminaries and at the Gregorian university in Rome, he was named bishop of Zamora in 1929 and headed this see during the difficult years of the republic. He specialized in labour and social problems. Mgr. Arce was largely instrumental in developing the Catholic Action in the archdiocese of Tarragona. He was transferred from Zamora to the diocese of Oviedo in 1929, where he supervised the reconstruction of damaged or destroyed churches in the Asturias region. At the same time he served as apostolic administrator of his former diocese. He was elevated to the metropolitan see of Tarragona in 1944 and was created

and proclaimed a cardinal at the consistory in Rome, Feb. 18, 1946. Cardinal Arce y Ochotorena wrote several books on canon law and various pastorals dealing with dogma and morals.

Archaeology

Six full years of the period covered by this résumé (1937-46) were war years; during this time there were naturally few full scale archaeological excavations. Moreover, the world economic depression of the earlier 1930s had somewhat curtailed interested donors, and the number of expeditions in the field in 1937-39 was less than in the earlier '30s. The unfavourable conditions set for excavators by some foreign countries also contributed to this slackening of activity.

Eastern Hemisphere

The fascination of ancient Egypt and Greece for the lay public and for museums made it almost always possible to stimulate at least some interest and financial support for work in those countries regardless of the fact that the excavator has no claim on any share of the antiquities he uncovers. No other regions can claim such popular interest, however, and restrictive antiquities laws have the effect of discouraging excavators, unless some fair portion of their antiquities may be returned to their supporting institutions. Another consequence, apparently not realized by regimes whose laws discourage competent excavators, is that avaricious and destructive illicit antiquities dealers flourish. Nevertheless, the wave of emotional nationalism which swept the world in the 1930s was in some cases reflected in the application of restrictive laws, and in fewer expeditions.

It must also be said that a number of the campaigns on larger sites which began in the '20s or early '30s were finished, and excavators looking for new sites were also cautious because of their apprehension over the general world unrest.

As World War II began, planned excavations were generally terminated. Some planned activities continued dur-

"Throne of Solomon," a fortress in northwestern Iran, as seen from the air by members of the 1935–37 expedition of the Oriental Institute of Chicago. This photograph appeared in Flights over

ing the period of the "phony war" (Sept. 1939-April 1940), but most of the wartime discoveries were made as results of accident. The brilliant exception to this was the record achieved by the enlightened Directorate of Antiquities in Iraq, with its spectacular success in exposing materials from almost the whole range of that country's history. Nor would the work of the Turkish archaeologists during wartime be forgotten.

In countries actually engaged in the war, the enforced pause which might have been used for catching up on the publication of results and for taking stock was only partially effective in this sense, as most of the professional personnel became actively engaged in the war.

Both the western Allies and the Russians had effective teams of archaeologists working in conjunction with their armies; these teams did yeoman service in keeping damage to archaeological museums, collections, surface monuments and libraries down to the minimum possible.

Laws and Methods.—The maturing of local governments in their methodological and scientific care of their own antiquities was not always an easy process. For example, in the Egyptian Service of Antiquities the search for an Egyptian who might be governmental director of archaeological work came to a halt when the Egyptian archaeologist who had been groomed for such work stepped out of the service under clouded circumstances. This left the service under the supervision of a Frenchman, following out a long tradition. Under conditions of an emotional patriotism in Egypt, such a situation was not a happy one and did not make for stability of the government agency of greatest influence for the development of archaeology and the preservation of monuments.

One of the most distressing episodes lay in the widespread damage done to the Theban tombs, from which pieces were removed for illicit sale. Between 1937 and 1942 about 40 guarded tombs were so attacked before the Egyptian government took action to tighten the guard system and to expropriate the Theban necropolis. In 1946 a model village was being constructed for those Egyptians living in the necropolis; eventually they were to be moved away from the area of temptation.

The effects of the various antiquities laws, either to restrict or encourage competent excavation, have already been suggested. Several important conferences were held which concerned themselves, at least in part, with the



establishment of mutually fair antiquities laws. The Cairo conference, called in 1937, under the auspices of the Institut International de Coopération Intellectuelle and sponsored by the League of Nations, made some valuable suggestions. Further understanding was gained at the unofficial Jerusalem conference of 1943. While the mandatory authorities refused to recognize this conference, its proceedings were on record.

More general conferences were held, especially those of the Institute of Archaeology of the University of London, where the legalistic aspects of excavation were also discussed. Sufficient thought was given to the matter so that recommendations could be made to the United Nations Educational, Scientific and Cultural organization of the general United Nations' organization.

Methodologically, the processes of complete and exact excavation and interpretation of archaeological materials stood to benefit largely from technological advances made during World War II. This was especially true in the case of aerial survey and photography; the status of this method was summarized by J. K. St. Joseph (Geographical Journal, 1945), and an extremely handsome example of the technique was E. F. Schmidt's Flights over Ancient Cities of Iran (1941).

H. Godwin and others continued to perfect methods for the analysis of pollen derived from ancient sites, especially in terms of the use of changing patterns of forest cover as an indication of time change. F. R. Matson pioneered in the microscopic analysis and objective description of the clays from which ancient pottery was made. There was a growing consciousness on the part of field archaeologists of the necessity of conserving the more unspectacular types of objects, and of animal bones, soil samples and other nonartifactual evidence, against the time when tests might be devised to aid in the interpretation of these materials.

Gains.—As this report will show, the great gains of the period 1937–46 were perhaps more in publication than in actual materials excavated. Of the items detailed below, the most important new finds were probably the following:

The fossil neanthropic Swanscombe man associated with flints of Acheulean type, the discovery of the Anyathian chopper-chopping tools of Burma, and the accidental finding of the remarkable cave paintings of the Grotte de Lascaux, highlighted the earlier prehistoric period. For the later prehistoric period, the excavations of Seton Lloyd and Fuad Safar in Iraq stood out, as did the uncovering of the earlier Syro-Cilician village materials at several sites, the clarification of the extent of the Ertebolle in Denmark, and work in neolithic and bronze age horizons in Russia. Excavations in the early historic period yielded important 21st-22nd dynasty and 1st to 2nd dynasty tombs in Egypt, more of the historically significant Mari correspondence in cuneiform, a remarkable cache of tablets at Pylos in Greece, and the spectacular trappings of an early British king in the Sutton Hoo ship burial.

The period also evidenced signs of growing concern with the broader aims of archaeology, that its goal must be far more than the filling of museum shelves, and the esoteric pleasures of its practitioners. In the first article of the new Journal of Near Eastern Studies (1942), J. A. Wilson made a plea for broader and more intelligible interpretations of archaeological materials as a contribution to general understanding. Grahame Clark's admirable popular book, Archaeology and Society (1939), pointed to the dangerous uses to which warped archaeological interpretation was put in the thought-controlled totalitarian countries, and implied that an intelligent public

should know enough of the facts of archaeology to reject dangerous racial and nationalistic interpretations. There was unrest concerning the old style systems of classification (cf. R. J. Braidwood's "Terminology in Prehistory," Human Origins—An Introductory General Course in Anthropology, Selected Reading Series II, the U. of Chgo., (1946), which were held to obscure general understanding. V. Gordon Childe's valuable syntheses, in somewhat historical materialist vein, appeared in the Pelican pocketsized What Happened in History (1942–46), and in his Huxley lecture (Jour. of the Roy. Anthrop. Inst., 1944); Childe's studies were objected to as "too materialistic," but they tended to correct a professional outlook which was not enough so.

Archaeology faced the atomic future with a realization that, since written records could account for less than one one-hundred-thousandth of man's life on this earth, its duty was to recover and make available human experiences and truths learned in that much vaster past. It was rather the role of the humanities and the social sciences generally to see to it that mankind might benefit from knowledge of its past experiences.

As 1937 began, the extent of archaeological knowledge could be said to be summarized in such books as M. C. Burkitt's Old Stone Age, V. Gordon Childe's New Light on the Most Ancient East, and the later volumes of the Cambridge Ancient History. The broad outlines appeared to be set, but subsequent developments were to show that even some of these broad lines were in error. Many voids in the framework were later filled in—with this came the realization of new problems, and a consciousness that various important types of evidence had been slighted, even in the periods which seemed well known. During the decade 1937–46, steps were taken to correct some of the oversights of this nature, and more could be expected in the future.

Fossil Man.—The period was marked by the appearance of some important finds in the field of human palaeontology, and also by the appearance of several monumental reports. These last consisted of F. Weidenreich's Giant Early Man from Java and South China (1945) and The Shull of Sinanthropus Pekinensis (1943); T. D. McCown and A. Keith's The Stone Age of Mt. Carmel, ii (1939); "Report on the Swanscombe Skull" (Jour. of the Roy. Anthrop. Inst., 1938); and W. M. Krogman's "Cranial Types from Alişar Hüyük . . ." (Oriental Inst. Publ., xxx, 1937) and "Racial Types from Tepe Hissar . . ." (Verhandelingen der Koninklijke Nederlandsche Akad. van Metenschappen, xxxix, 2, 1940). C. C. Coon's comprehensive Races of Europe (1939) was a landmark in physical anthropology.

Weidenreich's works took into consideration the newly recovered fossil materials of China and Java, and were important not only in their excellent presentation of materials, but also in that their author struck at "monocentrism," the theory that man (as a culture-bearing, tool-using being) had only one place of origin. According to Weidenreich's polycentric theory, man's early ancestors were scattered throughout a great part of the earth and developed independently in locations selected accidentally. One of the important facets of Weidenreich's position was that Neanderthal man, in Europe as elsewhere, was not exterminated by later types but himself developed into later types.

McCown and Keith's H. palestinensis was already a mixed breed, but these authorities were not inclined to

see direct evolution from neanderthaloid to *H. sapiens* types. New neanderthaloid fossils made their appearance in Tangiers, South Africa, Monte Circeo in Italy and at Teshik Tash and Kiik Koba in Russia.

The remarkable discovery of a very early neanthropic type in a gravel pit near Swanscombe, England, was promptly and fully reported. This *sapiens*-like type was found associated with Acheulean type flints in beds assigned to the second interglacial period.

A human skull was rediscovered in the collections from the site of Chatelperron, apparently pertaining to this earliest west European blade-tool assemblage. Another human fossil, apparently associated with the same general type of artifacts, appeared at Ksar 'Akil, north of Beirut, in Lebanon.

An interesting and presumably Upper Pleistocene human fossil appeared at Keiloi, Australia, but was not fully reported. The exact whereabouts of the original Sinanthropus material from near Peking, China, was now in question—it might have been sunk while in transshipment to the U.S.

The work of W. M. Krogman on the human populations of the ancient near east was of extreme importance, and the Turkish physical anthropologist, M. S. Şenyürek, made valuable additions.

The Early Prehistoric Period: 500,000 to 8,000 B.C.—Several studies appeared after 1937 which were of such breadth as to concern the earlier prehistoric archaeology of the whole eastern hemisphere. Two of these studies were T. T. Paterson's On a World Correlation of the Pleistocene (1941), and "Geology and Early Man" (Nature, 1940), which attempted to bring late geological and archaeological information together in an understandable whole. Paterson's approach to the classification of both human palaeontology and archaeology was essentially monocentric; one of his schemes suggested possible family-genus-species relationships for the various different types of early stone tools.

H. L. Movius' Early Man and Pleistocene Stratigraphy in Southern and Eastern Asia (1944) also had broader implications than its title implied. It was Movius' position that the stone tools of the far east pertain to a tradition (a set of persistent habits in manufacture) not formerly recognized, and completely separate from those of Europe and Africa. This was a basic challenge to science's understanding of early cultural distributions. Previously, it had been assumed that some such scheme as that presented so clearly by Paterson might have held. Movius' new approach, when coupled with Weidenreich's polycentric theories, opened vast new possibilities (and problems) in the attempt to arrive at a general understanding of man's prehistoric past.

Two contributions by the geologist, F. E. Zeuner, The Pleistocene Period (1945) and Dating the Past (1946), were of great importance, although not without controversy. In the latter volume especially, Zeuner also attempted to bring together the important facts of geology and prehistoric archaeology. His attempt at a geochronology, and the means of assessing dates for archaeological materials which it implied, was in part based on the similarities of curves plotted to show geological (especially glacial) phenomena with the curves of variations in the amount of solar radiation received by the earth. While the over-all dates supplied by the Zeuner scheme were commendably conservative, the time durations implied for the last phases of the Ice Age were much longer

than had formerly been suspected.

Three very important contributions to the understanding of prehistoric times in the west appeared in the Papers of the Peabody Museum of Amer. Anthrop. and Ethnol., Harvard Univ. Harper Kelley's "Acheulean Flake Tools" (1937), and T. T. Paterson's "Core, Culture, and Complex in the Old Stone Age" (1945) approached an examination of the real meanings of the existing system of classification of earlier palaeolithic antiquities. D. A. E. Garrod's "The Upper Palaeolithic in the Light of Recent Discovery" (1938) was a landmark; in this synthesis, Miss Garrod suggested the relationships and significance of all of the main groups of archaeological materials of latest Pleistocene times, from the near east to Britain and from the Baltic to Kenya. She insisted that the prehistory of all Europe and beyond need not conform to the classic scheme set in France. Her point of view was underlined by R. Lantier's account (Proceedings, Prehistoric society, 1945) of wartime discoveries in France, which showed ever increasing complexity, local variation and partial contemporaneity of the once classic "Aurignacian, Solutrean, and Magdalenian" materials. It is also interesting that the thesis of Garrod's "The Near East as a Gateway of Prehistoric Migration" (Bulletin, Amer. Schools of Oriental Research, 1937) -for an eastern centre of origin of the blade-tool traditions, with subsequent westward extensions-was later followed in France, as Lantier's remarks on Périgordian origins indicated.

Some important events took place in western Europe in spite of World War II. In 1939, H. Breuil made excavations near Abbeville in the Somme valley in France, and fixed the occurrence of the earliest biface type of flint hand axe, the Chellean, to the Günz-Mindel (or first) Interglacial. Since the material from the type site, Chelles, was not stratified, Breuil's suggestion that the type tool be referred to as "Abbevillian" was generally accepted. At about the same time, T. T. Paterson established a key sequence of earlier ice-age implements at Breckland, in eastern England. The name "Brecklandian" was applied to a variety of flake tools once less specifically included in Breuil's Clactonian, and the area also yielded an Acheulean with a secondary Brecklandian element.

This occurrence of some flake tools with the biface Acheulean tools took place not only in the Breckland sequence and in the materials studied by H. Kelley (see above), but also, among other places, in the Barnfield gravel pit in Kent, England, where the neanthropic Swanscombe skull was found. The importance of this find, associated with flint tools of which some were of standard middle Acheulean type, has already been suggested in the section on fossil man.

Breuil also published (*Proceedings*, Prehistoric society, 1942) a brief opinion on the crude pebble-tool industries of the Atlantic coastal terraces of Portugal. The shell-food collectors who produced this industry were said to have shown remarkably little ingenuity over a vast range of prehistoric time. Breuil suggested calling these industries "Lusitanian," to distinguish them from the more normal artifacts of the interior.

V. Gordon Childe contributed a very important review article in Antiquity (1944) on L. Pericot Garcia's remarkable cave sequence at Parpalló, near the southeast coast of Spain. The following stratified sequence was recovered: Gravettian, Lower, Middle and Upper Solutrean, Solutreo-Gravettian, Magdalenian I-IV. Both this sequence and the artifactual materials contained in it were of great significance to an understanding of the Upper Palaeolithic of western Europe. Formerly, the Solutrean was

supposedly restricted in Spain to the northern part at best. Now it was accounted for not only nearer to Gibraltar, but as an assemblage which included some flaking of 'Sbaïkian type; some excellent tanged points probably developed out of the Aterian type (both of which are elements of the Aterian industry of northwest Africa and Kharga oasis); and some microliths including a few microburins. The typological similarity between the proper Solutrean laurel-leaf point and the 'Sbaikian point, in the Parpalló material, made a strong case for the idea of an original Solutrean homeland in Africa. It might also be found that the Aterian type of tanged point was ancestral to the points of Font Robert in France, while the early appearance of the microliths precluded too late a dating for the Capsian and the microliths of claimed Magdalenian context in Europe.

The knowledge of a southward extension of the Magdalenian to the Parpalló area of Spain was also new. More exciting was the yield of engraved or painted slabs, in which at least some of the drawings were of recognizable animals. This artistic activity was evidenced from all of the levels; the painted drawings actually declined in proportion in the Magdalenian. The art, however, did approximate that of the Franco-Cantabrian style, and yielded none of the characteristic cinematic drawings of the proper East Spanish or group II art. The dating of this latter style had always been troublesome; the new Parpalló evidence would seem to force the date of group II to some time later than the latest layer in the Parpalló sequence, Magdalenian IV (but see below).

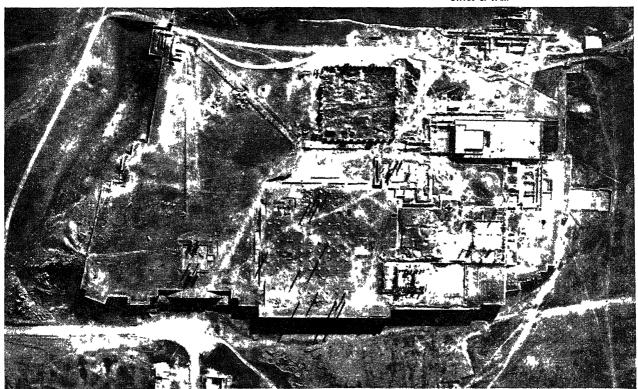
The really great discovery of the period in the field of prehistoric art, that of the Grotte de Lascaux, Dordogne, France, had not yet been published in full at the end of the decade, although various preliminary accounts and illustrations had appeared (e.g., Nature, 1941; Amer. Jour. of Archaeol., 1942; Proceedings, Prehistoric Society, 1945). The Lascaux cave comprises a large oval hall with axial passage, off which a lateral passage leads to a high gal-

lery. Numerous pictures of animals occur on the walls and ceilings, painted in bistre, red or black, upon a light background. Horses of at least three varieties, oxen, red deer, fallow deer and possibly Megaceros appear, but neither reindeer nor mammoth. Four bulls (Bos primigenius) are more than 5.5 metres in length. Some of the animals are shown pierced by arrows. One apparent scene shows a half-schematic drawing of a man lying on his back, while a woolly rhinoceros moves away. To the right of the figure of the man appears a bison, pierced by a lance, and with a large gaping belly wound from which entrails seem to escape. Under the feet of the man lies a hooked object, possibly a spear thrower, while in front of the figure stands a curious object, apparently a bird mounted on a stick.

The Lascaux paintings are assigned to the Périgordian industry (Chatelperronian-Gravettian). On stylistic grounds—especially as to the representation of horns and hoofs in twisted perspective, and in the attempts at composition—the Lascaux art is compared with the East Spanish art rather than with the Franco-Cantabrian style of the Magdalenian. But in a wider sense, it could be suggested that the Lascaux art may be ancestral to both these later styles.

In 1937, A. Rust published his Die Altsteinzeitlicher Renntierjägerlager Meiendorf, concerned with the first evidences of man on the frozen plains of northern Europe, as evidenced by his excavations at Meiendorf and Stellmoor, near Hamburg, in Germany. While the plain was still open tundra, reindeer hunters used to camp on it, between June and September, beside small meres. On the camping places only flint-blade tools survive, but the peat and mud of the adjacent meres have preserved tools in all stages of manufacture out of reindeer antler, antler

Ancient palace terrace of the Persian kings at Persepolis photographed from the air by the Oriental Institute of Chicago during its expedition of 1935–37 and published in *Flights* over Ancient Cities of Iran



harpoons, arrowheads, and knife handles with flint blades still in place and the skeletons of whole reindeer that had been cast into the waters, weighted with stones, as sacrifices. These reindeer were more closely allied to the American and east Asiatic species (Rangifer arcticus) than to the modern European reindeer (R. tarandus). Their hunters were but temporary visitants to these farnorthern tundras, having their winter quarters probably in southern Germany. Another encampment at Stellmoor, however, dates from a very much later time, when pinewoods had already invaded the tundra, although reindeer were still the chief game in north Germany.

H. L. Movius' The Irish Stone Age appeared in 1942, reporting on the excavation of six Stone Age sites-one in County Waterford and five in Northern Ireland. The first part of the book is an intensive re-examination of the late glacial and postglacial chronology of northern and northwestern Europe, with emphasis on Great Britain and Ireland. The geochronological setting is necessary, since the available Stone Age range of Irish material does not immediately conform to the classic industries of western Europe. The assemblages in question are called Early and Late Larnian (from a concentration of the finds along the coast at Larne). The earlier material is fixed in time by overlying beds of Late Boreal-Early Atlantic peat (at least c. 6000 B.C.); the Late Larnian assemblage was still being produced when the Neolithic peoples began to appear about 2000 B.C. The Early Larnian flint tools include blades, scrapers and picks; superficially tanged points, choppers and a few axes are added in the late assemblage. The producers of the Larnian materials seem to have been hunters, food collectors and fishermen, whom Movius believes to have reached Ireland from northwestern Europe before the Litorina submergence. They seem to have been descendants of the final Upper Palaeolithic peoples of northwestern Europe, and, although later arrivals in Ireland pushed them into the interior, their basic stock is present in the modern Irish people.

The status of prehistoric studies in North Africa was summarized by L. Braidwood's "The 'Palaeolithic' and 'Mesolithic' of North Africa and the Eastern Mediterranean" (Human Origins . . ., Selected Readings, Series II, The Univ. of Chgo., 1945-46). For the earlier ranges of time, R. Neuville and A. Ruhlmann's investigations of the quarry sites at Sidi Abderrahman, Casablanca, Morocco (La Place du Paléolithique Ancien dans le Quaternaire Marocain, 1941), were of importance. The stone tools from the earliest deposit (90-100 metre terrace, equated with the Günz glaciation of Europe by the excavators) are large and crude implements of quartzite and sandstone. It is of special interest that the label given these tools (certainly with the Abbé Breuil's approval) was "Clacto-Abbevillian." This implied a combination of the core (biface) and of the flake preparation traditions in this area, in earliest times. Other tool types were mentioned in the succeeding terraces of the area; Tayacian, Abbevillian, Acheulean, Levalloisian, and Mousterian were said to be accounted for.

Valuable atypical Upper Palaeolithic and Neolithic materials were excavated at Mugharet el-'Alyia (high cave) in Tangier by C. C. Coon for Harvard university. The important work of R. Vaufrey on the Capsian industry and its derivatives continued with the appearance of his L'Art Rupestre Nord-Africain (1939). This volume was the result of Vaufrey's examination of evidence for dating the rock art of French North Africa. He was convinced

that none of this art was earlier than the Neolithic of Capsian tradition, and that some of it persisted into historic times. The report was also a useful source on the general prehistoric archaeology of the area.

The general understanding of prehistory in Africa south of the tenth degree north parallel (i.e., nether Africa) increased considerably during the decade. In 1937, C. van Riet Lowe's "The Geology and Archaeology of the Vaal River Basin" appeared, in which the south African handaxe implements were fixed within the geological framework of the area. Later Prof. van Riet Lowe and his colleagues made a number of important contributions, including van Riet Lowe's "The Evolution of the Levallois Technique in South Africa" (Man, 1945), in which the role of the Levallois (flake facies) tool preparation tradition was examined in detail. The following quotation from this paper is an important statement of position:

It is extremely interesting to compare the European position with the South African. No element of the basic technical processes of the European Levallois is absent from South Africa. Every type of European Levallois core and flake has its South African counterpart-with this great and important difference: in South Africa the Levallois, in its inception, is an integral part of the Great Hand Axe Culture and it continues to remain so and to develop integrally with bifaced tools from an early stage of the Lower Palaeolithic right up to the end of the Mid-Palaeolithic or Middle Stone Age; i.e., first with the cultures that include comparatively heavy bifaced tools such as hand-axes, and later with those that include the lighter and more slender bifaced lanceolate or Solutrean-type points. In other words, the Levallois is not a separate culture in South Africa, but rather a process or technique which is inseparable from every material culture known to include post-Abbevilliantype bifaced tools-tools that resemble forms from Chelles, St. Acheul, Combe Capelle, La Micoque, and finally Solutré, i.e., the South African Levallois elements represent the wasteproducts of a series of developing cultures which aimed, inter alia, at the production of bifaced tools from Acheul-type hand axes in the beginning to Solutré-type lanceolate points at the

H. S. B. Cooke's "A Preliminary Survey of the Quaternary Period in South Africa" (Bureau of Archaeol., Archaeol. Series, Dept. of Interior, Union of S. Af., 1941) was a somewhat more general statement of the whole range of prehistory, and of geological and archaeological interrelationships.

For East Africa, T. P. O'Brien's The Prehistory of the Uganda Protectorate appeared in 1939. It was understood that van Riet Lowe and E. J. Wayland also had jointly prepared an extensive report on the geology and archaeology of the area, and that their conclusions differed from those of O'Brien in several fundamental respects.

While an anonymous note in Antiquity (1944) indicated that west Africa may have supported a long sequence similar to that of south Africa, the area was little known archaeologically. In 1939, R. Delcroix and R. Vaufrey (L'Anthropologie) demonstrated that elements of the Tumbian of Portuguese and French Guinea were derived from the Neolithic of Capsian tradition.

For the near east, 1937 marked the date of appearance of D. A. E. Garrod and D. M. A. Bate's *The Stone Age of Mount Carmel*, vol. 1, not only a great contribution to knowledge, but also a book which would undoubtedly remain, for years, a model excavation report. The main lines of the Mount Carmel sequence had already been blocked out in earlier preliminary reports—the sequence proceeding from materials of Tayacian type through Acheuleanlike and Levalloiso-Mousterianlike industries into a more localized succession of blade-tool industries

with Chatelperronian and Middle Aurignacian tools. Then, after an Atlitian (or debased Chatelperronian) came a gap, followed by the rich microlithic assemblage called the Natufian. The Acheuleanlike levels also yielded an increment of blade tools, by typological assessment, the earliest appearance of this type of implement. The Levalloiso-Mousterianlike levels yielded also the human fossils of *H. palestinensis*. The Mount Carmel sequence not only furnished Palestine with a known prehistoric past, but also demonstrated that this past differed from the classic European Chellean to Magdalenian sequence, especially at its later end.

Preliminary accounts of excavations in the cave of Kasr 'Akil near Beirut, Lebanon, by J. W. Murphy (Boston College Grad. School, Anthrop. Series, 1939) complemented the Mt. Carmel materials, and indicated that the Atlitian may have been followed by a variation of the Gravettian, with microliths.

Information on eastern Europe and Russia was not so readily available, but P. P. Efimenko's Paleolit i Neolit SSSR (1945) was an important key to knowledge of the area. This was a collection of about 21 papers by Russian archaeologists, reporting work done up to the time of the soviet union's entry into World War II. The papers mainly concern upper palaeolithic to neolithic materials, and have concise but usable French summaries. The volume also includes a very valuable list of palaeolithic sites in the U.S.S.R., complete up to 1938, and with brief notes and the principal bibliography on each site. The list is given in terms of primitive Mousterian and Clactonian, Mousterian, and Upper Palaeolithic and Epipalaeolithic, and the sites with materials so classified are then listed regionally for both European and Asiatic Russia.

There was also, for Russia, V. Gordon Childe's useful summaries in Man (1942-43), which included some details of the important Crimean cave site, Kiik-koba. The lower levels of this cave contain a Tayacian similar to that of Mt. Carmel; the upper levels yield an industry with some Micoquianlike hand axes, plus a larger proportion of flake points and side scrapers. Important occurrences of blade-tool industries are also accounted for, but Childe insisted that true Solutrean and Magdalenian materials could not yet be demonstrated from Russia.

Investigations of the Ice Age antiquity of the far east were carried on with relative intensity until the outbreak of World War II. Important detailed reports and several general summaries of the Choukoutien excavations, near Peking, China, were issued by W. C. Pei. H. De Terra and T. T. Paterson made significant discoveries in northwestern India, and De Terra and H. L. Movius worked together on the Pleistocene geology and archaeology of Burma. The result of all this work was summarized in some detail in Movius' admirable Early Man and Pleistocene Stratigraphy in Southern and Eastern Asia (see above). In this volume, the Pleistocene artifacts of China, Burma, India and Java are treated in terms of a chopperchopping tool tradition, which Movius believed to be unconnected with the tool preparation traditions of Europe. With his own Burmese materials as a control, Movius applied his scheme to the extant antiquities from the other areas, and arrived at a much more comprehensible classification than had previously been offered. The Burmese stone tools (called Anyathian by Movius) are of three major types: (1) the chopper, a large, crude scraper; (2) the chopping tool, usually a large pebble with flakes removed so as to give a sinuous cutting edge; and (3) the hand adze, produced from a roughly tabular piece of material, and provided with a single-bevelled adze bit. Movius' examination of the materials from the surrounding areas convinced him that they also fit, in a general way, into this chopper-chopping tradition. In northwest India, however, there was some evidence that a blending of eastern and western traditions presently took place.

Peninsular India, in fact, was shown by the materials collected by E. C. Worman, for Harvard university, to have supported an apparently flourishing prehistoric population which used tools of the western Acheul and Levallois facies. However, P. E. P. Deraniyagala (Spolia Zeylanica, 1945) was of the opinion that some of the early artifacts in Ceylon conform to the eastern chopper-chopping tradition.

It has already been suggested that the implications of Movius' interpretation were profound. Previously, any attempt to seek new world origins in old world archaeological materials had seemed sterile, as the artifacts in America are not generally comparable with those of Late Pleistocene Europe. There was another source to be examined; some of its materials had in fact already existed. but were relatively buried in that they had been cast into the European classificatory system, and thus it seemed impertinent to examine them.

Much more information was necessary before the true role of the far eastern chopper-chopping tool tradition became clear, however. As to its contribution to questions of new world origins, most of the finds made through 1946 seemed much too early to be pertinent to the new world. Also, knowledge of northeastern and arctic Asia was very limited. A useful summary of the archaeology of this area was E. M. Davis' "The Archaeology of Northeastern Asia" (Papers of the Explorers' Club, 1940).

Late Prehistoric Period: 8000-3000 B.C. and Later.— Several significant general studies appeared concerning the period when the first basic revolution in human economy (i.e., food production; domestication of plants and animals, settled village life) took place. Some of V. Gordon Childe's work has already been mentioned; his important Dawn of European Civilization appeared in its second edition in 1939, and a third edition was in press in 1946. C. F. C. Hawkes' Prehistoric Foundations of Europe (1940) was also useful for the same period; both books were concerned with the neolithic and bronze age developments of Europe and the circum-Mediterranean basin. Later general surveys of the near eastern village cultures and what led up to them, were in brief papers by R. and L. Braidwood (Human Origins . . ., Selected Readings, Series II, The Univ. of Chgo., 1946). Childe's "The Orient and Europe" (Amer. Jour. of Archaeol., 1939) stressed particularly the importance of near eastern stimuli on the development of food-producing societies in Europe, and also the difficulties still involved in dating the European materials.

The role of Iran in the earliest village culture stage became much clearer with the appearance in 1937-39 of both R. Ghirshman's two volumes, Fouilles de Sialk, près de Kashan, and E. F. Schmidt's Excavations at Tepe Hissar, Damghan. The site of Sialk yielded one of the very earliest examples of village-culture material yet known, while that of Hissar added very significant details to knowledge of the succeeding developments. For developments in the distinct southern and western areas of Iran, A. Langsdorff and D. E. McCown's publication of Tall-i-Bakun A was the most important contribution.

Two brilliant syntheses of these early materials were D. E. McCown's The Comparative Stratigraphy of Early

Iran (1942) and "The Material Culture of Early Iran" (Jour. of Near Eastern Studies, 1942), in which the two distinct developments in the north and east, and in the south and west, were traced through their courses and into the period when the incoming gray-ware cultures seemed to bring an end to both earlier traditions. McCown integrated his materials with those of early Mesopotamia, and made use of the collections deriving from A. Stein's reconnaissance in Persian Baluchistan.

Relatively little material appeared in the Baluchistan-Indus area proper which is antecedent to the Harrappan civilization (see below). S. Piggott's summary of the archaeology of the area (in Ancient India, 1946) was very useful, and McCown also contributed a useful preface on the role of this area in E. J. Ross's report (Jour. of Near Eastern Studies, 1946) on the pottery from Rana Ghundai, northern Baluchistan.

West of Iran, in Iraq, there was work of extreme importance carried on by S. Lloyd and F. Safar for the Directorate of Antiquities of the Iraq government. At Tell Hassuna (Jour. of Near Eastern Studies, 1945), south of Mosul in northern Mesopotamia, Lloyd and Safar recovered a remarkable sequence of materials in the range of the earliest village culture assemblages of western Asia. The basal layer in the sequence contained three superimposed camp sites with hearths, coarse pottery, and both chipped and ground stone tools.

Above the camp sites were at least six successive architectural phases, characterized by Lloyd and Safar as the Hassuna levels. The several-roomed adobe buildings of these levels contained three major groups of pottery, the Hassuna archaic, the Hassuna standard and the Samarran (the first group restricted to the lowest floors, the last group to the middle and upper floors). The first two ceramic groups were tentatively known from the minute exposure of Nineveh I-hitherto the earliest north Mesopotamian village material. Various small objects in clay, stone and bone appeared; the sustenance pattern was indicated by sickle blades, silos and the bones of domesticated sheep (or goats) and cattle as well as of wild animals. There were burials, but the bones seem to have been badly preserved, and no studies of the human physical types were yet available.

The Hassuna levels were superimposed by levels containing pottery of the Halaf range, then of the Ubaid range, and in the disturbed surface layer there was Assyrian pottery.

The importance of the Hassuna discovery was in the area of the exposure made and in the bulk of material reclaimed and presented from so early a range of village materials. The excavators possibly exaggerated the difference between the basal camp-site material and that from ' the Hassuna levels; since the latter was already present in Nineveh I, the claims made in press releases on Hassuna as to its being the earliest village yet known needed qualification (cf. Time, Nov. 12, 1945). Actually, insofar as means of dating were reliable for those times, there were excavated village materials of equivalent antiquity from Iran to Egypt. However, Hassuna's importance appeared to be self-evident; it also depended to some extent on the fact that the position of the Samarran pottery was stratigraphically fixed. Primarily, Hassuna contributed significantly to an understanding of the beginnings of settled life in the area where, subsequently, civilization made its first appearance.

Very important materials from subsequent village-cul-

ture levels in the same area were indicated by E. A. Speiser's preliminary reports on Tepe Gawra (Bull., Amer. Schools of Oriental Research, 1937–38; Asia, 1938). At this site, considerable exposures in the Halaf, Ubaid and following levels had been made, and the appearance of niche-decorated temples in the Ubaid period was most significant.

In Lloyd and Safar's work at Tell 'Uqair (Jour. of Near Eastern Studies, 1943), about 50 miles south of Baghdad, a temple of the Uruk period (the second of the three predynastic sequences in south Mesopotamia; i.e., the Ubaid, Uruk and Jemdet Nasr periods) was exposed in some area, and smaller soundings yielded material of all three of the predynastic sequences as well as some materials referring to historic times. The indicated stratification was, in brief, as follows: (1) the earliest or Ubaid material, from a small sounding which reached virgin soil after proceeding through seven layers of occupation; (2) the earliest traces of a platform prepared for a temple, but for which only architectural evidence was available; (3) the Uruk period temple, on its platform, and with interior walls decorated with frescoes; (4 and 5) two successive fillings of the platform, from which potsherds of the nonpainted but burnished Uruk variety appeared, as they had in the painted temple; (6) a layer with no surviving buildings but with painted pottery of the Jemdet Nasr type; (7 and 8) two successive occupations of a chapel, first with Jemdet Nasr painted ware and scarlet ware and with a new type of brickwork; and (9) traces of later Akkadian and Babylonian occupations on a small scale and without massive architecture.

The earliest, Ubaid assemblage was important in that a considerable variety of the characteristic painted pottery was recovered (actually more common in buff ware than in the supposedly most characteristic greenish ware) with painted motifs including representational drawings of birds and animals as well as the usual geometric repertoire. The Ubaid assemblage also included a considerable number of baked clay tools: sickles, long "nails" with hooked points, and some very remarkable shaft-hole axes of which one type definitely recalled the battle axe of Troy II type. Bone tools in bitumen hafts also appeared, as well as flint hoes and fragmentary clay figurines of the Ur Ubaid type.

The work of the Germans at Warka was continued up to the beginning of World War II, and P. Delougaz and

An important archaeological discovery of 1940 was the tomb of Pharach Psou Sennes, discovered by Prof. Pierre Montet of France on the site of ancient Tanis, Egypt. Montet is shown examining the silver sarcophagus after its lid had been removed



S. Lloyd's Pre-Sargonid Temples in the Diyala Region was concerned in part with some late prehistoric material, and included an ingenious suggestion for assessing dates of buildings by a count of the presumably annual layers of plastering on wall faces.

An important summary of knowledge of predynastic Mesopotamia was prepared by A. L. Perkins.

A considerable amount of important work took place in Syria, both in its upper Mesopotamian portion and to the west of the Euphrates. M. E. L. Mallowan's final report on Tell Chagar Bazar appeared (Iraq, 1937), and the same excavator then exposed a most useful sequence of materials at Tell Brak (Illustrated London News, 1938–39), with monumental architecture comparable with that of earliest historic times in southern Mesopotamia.

The first volume of the final Tell Halaf (H. Schmidt, 1943) publication reached the U.S.; the famous pottery from this site which gave its name to one of the early west Asian village cultures, seemed well presented. It was clear, however, that the site of Tell Halaf contains transitional Halaf-Ubaid and Ubaid pottery as well as the classic Halaf style.

Another important upper Mesopotamian site, Baghouz, with spectacular Samarran painted pottery, was described (Journal of Near Eastern Studies, 1944).

The final publication of the Oriental institute's excavations on the village-culture materials in the plain of Antioch neared completion in 1946; in it, knowledge of the earliest village materials of Syro-Cilicia was made clear. C. F. A. Schaeffer's Ugaritica, I (1939), included some details of the earlier levels of the remarkable coastal site of Ras Shamra; knowledge of the coastal sequence was elaborated by A. M. N. Ehrich's publication (Memoirs, Amer. Philosophical society, 1939) of the early Qal'at er-Rus materials, and by R. and L. Braidwood's soundings (Syria, 1940) near Tartous. Inland, at Hama on the Orontes, H. Ingholt's (Amer. Jour. of Archaeol., 1942) deepest levels also exposed early Syrian village materials. Essentially, the earliest Syrian village material is characterized by a dark-faced burnished pottery and a distinctive chipped and polished stone industry. Levels with this material presently show signs of slight Halaf influence, followed in turn by traces of a transitional Halaf-Ubaid ceramic style, and then by an intrusion of the north Iraq Ubaid pottery style in some quantity. The first marked appearance of metal tools comes in the succeeding period, linked on ceramic grounds to the Uruk of north Iraq type, and then follows a period of considerable importance for the comparative archaeology of earliest historic Egypt and Mesopotamia.

For southern Syria, which seems to have conformed more closely to the Palestinian province, the appearance of M. Dunand's Fouilles de Byblos, I (1939) containing the énéolithique cemetery material, was significant.

The basic outline of the early village sequence in Palestine was described in 1937 with the appearance of G. E. Wright's The Pottery of Palestine. Although subsequently excavated materials pointed to the necessity for minor revisions and additions to Wright's interpretation, the main lines were then drawn.

For the whole near east, it was only in Palestine that the gap in knowledge separating the extant food-gathering stage and early village-culture materials was said to be closed. The actual evidence on this point, supposedly connecting the rich cave-dwelling Natufian assemblage with the village material at the base of the mound at Jericho, was, however, far from clear. The question was somewhat complicated by the excavations of M. Stekelis at the

cave of Abū Uṣbas, where an Upper Natufian with pottery was reported (Bull., Amer. Schools of Oriental Research, 1942–43). The potsherds were enigmatic, but the whole assemblage (when fully described) might be found to refer to a coastal culture somewhat different from those indicated by the materials of early inland Jericho.

P. L. O. Guy and R. M. Engberg's Megiddo Tombs (1938), and G. M. Shipton's Notes on the Megiddo Pottery (1939) added to the growing list of publications on that site. N. Glueck's The River Jordan was a most successful popular account of the river's geography, archaeology and history, and followed Glueck's detailed studies of materials collected in extensive archaeological surveys in Trans-Jordan. Taken with other explored or excavated sites, Glueck believed his surveys made it possible to demonstrate that Chalcolithic civilization in the Jordan valley was widespread and based on an agriculture dependent on well-developed irrigation, a postulate which was interesting in view of W. C. Lowdermilk's suggested "TVA on the Jordan."

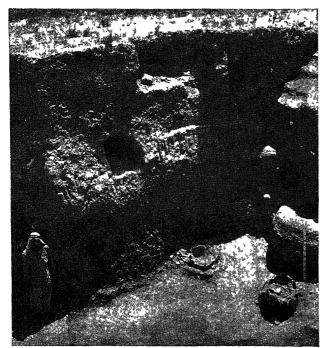
The second report on the large-scale early village exposure at Ghassul appeared, and the Jewish Palestine Exploration society began explorations at Khirbet el-Kerak, near Galilee.

For Egypt, perhaps the most valuable work for late prehistoric times was the appearance of G. Brunton's Mostagedda and the Tasian Culture (1937), in which the sequences of predynastic and early dynastic cultures were set forth with discernment in a summary of knowledge to that date. Several important papers by A. Scharff appeared, of which "Die Frühkulturen Ägyptens und Mesopotamiens" (Der Alte Orient, 1941) was concerned with the evidence of early interrelationships between Egypt and Mesopotamia. H. Frankfort's "The Origin of Monumental Architecture in Egypt" (Amer. Jour. of Semetic Languages, 1941) was a penetrating examination of the same subject matter; so, also, was H. Kantor's "The Early Relations of Egypt with Asia" (Jour. of Near Eastern Studies, 1942). Kantor also examined the evidence for a separate late period in her "The Final Phase of Predynastic Culture" (ibid., 1944), and concluded that the Semainean had little substance in its own right.

There was little actual excavation in predynastic horizons in Egypt during the decade 1937-46, save for the continuance of the Austrians at Merimde village up to the beginning of World War II.

In Anatolia, some foreign excavations were in progress up to 1940, and the Turkish Historical society was commendably active. H. Z. Koşay continued his important work at Alaca Höyük (1944), from which more of the spectacular copper age tombs were ably reported, and also materials from the preceding chalcolithic levels. The Belleten noted important new material from the sites of Dündartepe and Tekeköy, near the Black sea port of Samsun, presented by K. Kökten and N. and T. Özgüç; this included dark-faced burnished pottery, mother-goddess figurines, and metals from the little known area of northern Anatolia. A summary of the status of Turkish protohistoric chronology by T. Özgüç, also appeared, as well as Ş. A. Kansu's notes on the mesolithic of Turkey.

H. H. von der Osten's three-volume report on the Alishar Hüyük appeared in 1937, giving details of the key sequence established at that site in central Anatolia by the Oriental institute. W. Lamb's report on Kusura appeared in the same year. H. Goldman's excavations at Tarsus, in Cilicia, reached late prehistoric levels (Amer. Jour. of



Lowest of six building layers excavated at Tell Hassuna in the upper Tigris valley, Iraq, as reported in 1945. Remains at this level were said to form the earliest trace of settled community life yet unearthed

Archaeol., 1937-40), and thus filled one of the gaps in the Mersin sequence. At this latter site, J. Garstang (Liverpool Ann. of Arch. and Anthrop., 1937-39, 1940; Amer. Jour. of Archaeol., 1943) exposed extremely important village material, especially valuable in elaborating knowledge of the earliest Syro-Cilician village cultures. Then, following a gap at Mersin of somewhat undetermined length, came a sequence demonstrating how the later village materials of Cilicia conformed more to those of the Anatolian than of the Syrian province.

For western Anatolia, C. Blegen's preliminary reports on the test excavations at Troy continued (Amer. Jour. of Archaeol., 1937-39) until the campaign was finished. Blegen's careful checking of the Troy sequence was of tremendous importance, as the materials from the site were crucial in questions of west Asiatic and European connections.

The great activity concerning early village remains in Cyprus had somewhat slackened by 1937, but P. Dikaios reported (*Illustrated London News*, 1939) the discovery of an early nonpottery neolithic site at Khirokitia.

A significant summary of the village-culture prehistory of the Aegean area by S. S. Weinberg appeared in 1946 (Amer. Jour. of Archaeol.). Weinberg's note on prehistoric Corinth (Hesperia, 1937) examined the early ceramic interrelationships of mainland Greece and the areas beyond. J. D. S. Pendlebury's The Archaeology of Crete (1939) was a landmark, in which all prehistoric (as well as historic) Cretan materials and their interconnections were treated with discernment. The most important bulk of lately excavated materials in the Aegean referred to the northern Greek (Macedonian) area, for which there were the various Olynthus reports and W. A. Heurtley's Prehistoric Macedonia (1939). These materials, comparable on the one hand with some of the Thessalian village materials, were of extreme importance in linking the near east to Danubian Europe.

The summaries of Childe and Hawkes on the Neolithic

and Bronze Ages of Europe have already been noted above. Archaeological excavations in that unfortunate continent were understandably curtailed during most of the decade 1937-46. Some very important results were obtained in Scandinavia through the works of T. Mathiassen, J. Troels-Smith and others (Proceedings, Prehistoric society, 1945). It became clear that there were three or four transgressions in the sub-boreal climatic phase; that the Ertebolle assemblage, with pottery, lasted all through the Atlantic phase and coexisted with the Dolmen period at the end, and that Dolmens are Sub-Boreal. The excavation of two contemporary and neighbouring sites, one Ertebolle and the other neolithic, yielded such dissimilar materials that it became clear the latter was not derived from the former, and an immigration of new peoples had to be postulated. Important studies of the later prehistory of Denmark, by both H. C. Broholm and J. Bronsted, appeared.

In Britain, a beaker (type of vase distinctive of the very beginning of the Bronze Age) was found at Rinyo, in the Orkney islands, and made possible the dating (c. 2000-1500 B.C.) of the already famous village at Skara Brae. Both sites yielded roomy huts with elaborate built-in furniture all of stone, showing the amenities of the early foodproducing stage even in peripheral regions. H. Godwin (Nature, 1944) produced evidence from pollen analysis to show how neolithic man cleared considerable land areas of forest by burning. While few full scale excavations were carried on in Britain during World War II, several important syntheses appeared. V. Gordon Childe's Prehistoric Communities of the British Isles (1940) was scheduled for its second edition, while J. G. D. Clark's Prehistoric England (1945) and J. and C. Hawkes Prehistoric Britain (1943) were excellent popular accounts. British archaeologists gave considerable thought to the future, and important statements of problems in general European archaeology appeared in Occasional Paper, No. 6, of the London Institute of Archaeology.

A handsome publication of the more rational German approach to late prehistory was W. Buttler's Der Donauländische und der Westische Kulturkreis der Jüngeren Steinzeit (1938). In it, the author's remarkable excavations at the Köln-Lindenthal neolithic village were drawn into the much broader framework of European archaeology.

Perhaps the most useful information on later Russian activities appeared in V. Gordon Childe's summaries (Man, 1942-44), and by V. Avdiyev (Amer. Jour. of Archaeol., 1945) and H. Field (Amer. Anthropologist, 1946). The south Russian-Caucasus area saw considerable activity until the German attack on the U.S.S.R. As unalloyed copper appears to have been used until the Iron Age began, the old style Bronze-age classification was of little use in the area. The successive assemblages characterized by the use of copper were divided into four periods; in each period, there are details with important comparative bearing, both toward the near east and toward Europe.

In the more northerly forest zone, a sort of neolithic with pottery preceded the beginning of food production (best evidenced by the Fatyanovo grave material). At Olem Ostrovo, a remarkable neolithic cemetery with upright burials was found. In the Fatyanovo, burials were contracted, or sometimes cremated, and placed in pits; meat bones of domestic animals and some artifacts were used as grave goods. The Russian prehistorians believed this new assemblage represented an adaptation of the older fisher-hunter economy, with livestock and some industrial habits having been borrowed from the south Russian area.

A collection of short reports on the late prehistoric archaeology of the Ural-Kama area was Archeologicheskie Pamiatniki Urala i Prikamia (P. N. Tretiakov, ed., 1940), well illustrated, and with French summaries. James Gaul's (Papers, Peabody Museum of Amer. Archaeol. and Ethnol., Harvard Univ., 1943) article on the Siberian Bronze Age in the Yenisei valley was an important contribution on relatively unavailable material from a remote area. Food production (or at least pastoralism) appeared to go back to at least 2000–1500 B.C.

Although little excavation took place after 1937, knowledge of the later prehistory of the far east became more readily available with the appearance of J. G. Andersson's "Researches into the Prehistory of the Chinese" (Bull., Museum of Far Eastern Antiquities, 1943), and of R. Heine-Geldern's Prehistoric Research in the Netherlands Indies (1945). Andersson's volume underlined the fact that late Chinese prehistory was still very much in the survey stage, with great preoccupation toward painted pottery, and with few adequately exposed village assemblages. He seemed strongly convinced that superficial resemblances between the painted pottery styles of China and of the west were not sufficient to demonstrate connections or western stimulation. Andersson anticipated that typologically earlier material than that in hand would yet be discovered, and made the point that it was not until the end of the Neolithic that village materials suddenly made their first appearance.

Heine-Geldern showed that while mesolithic and earlier remains were relatively available from caves in Indonesia, the open village sites of early food producers were found only by accident, and hence that early village materials were still relatively scarce. Large numbers of polished stone tools of the full Neolithic were available, but not chronology, based on stratigraphic sequences. The end of the Neolithic was also unclear. Heine-Geldern postulated a time soon after 600 B.C. for the appearance of the Dongson bronze celts, and that iron appeared not long afterward. The methodology used in this area depended considerably on ethnohistorical and linguistic evidence.

Early Historic Period.—Probably the most important step during the decade 1937-46 in increase of knowledge of ancient times was the information on thousands of cuneiform documents from the site of Mari, on the middle Euphrates, in Syria. Here, A. Parrot's French expedition found, in the palace of King Zimri-Lim of the 18th century B.C., the clay tablets containing a correspondence of such historical significance as to rival the Tell el Amarna letters. G. Dossin and F. Thureau-Dangin (e.g., Syria, 1938 ff.) were active in the publication of the Mari tablets. Through 1946, the most important implications of the contents of the Mari letters were in the direction of reducing the chronology of western Asia.

Before the actual sequence of events in the lowering of the chronology are detailed, it must be remarked that supporting evidence was derived from the continuation of significant excavations by L. Woolley at 'Atshanah-Alalakh in northwest Syria, by C. F. A. Schaeffer at Ras Shamra-Ugarit on the north Syrian coast, and by the publication of the Assyrian king list discovered by the Oriental Institute at Khorsabad (in 1932-33).

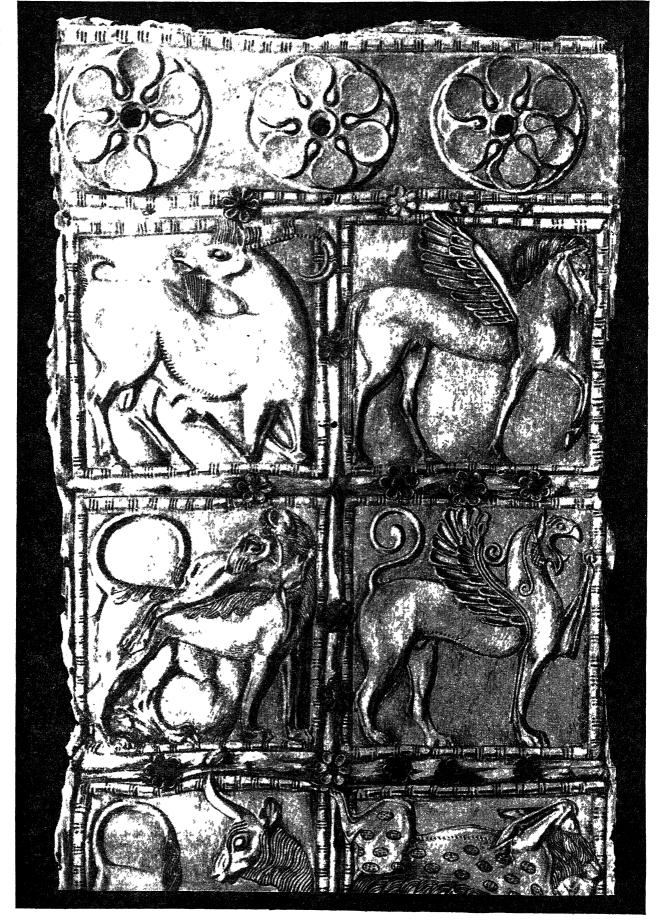
Up to 1939, the standard textbooks were placing the date of accession of the great Babylonian king and law giver, Hammurabi, at about 2000 B.C. One was assured that the Mesopotamian chronology was for all intents and purposes as reliable as that of Egypt, where a tolerance of little more than 25 years was needed to express the first date of the 12th dynasty (cf. W. F. Edgerton, Jour. of

Near Eastern Studies, 1942, who assessed the probable date of Amenemhet I as 1989 B.C.). T. Jacobsen's penetrating Sumerian King List (1939) gave Hammurabi's dates as 2067-25 B.C. At this point, the Mari correspondence began to appear, and W. F. Albright pioneered the use of this evidence, and lowered the accession date of Hammurabi to about 1870 B.C.; slightly later, Albright found comparative Egyptian and Syrian evidence to lower it again to about 1800 B.C. Late in 1940, S. Smith's brilliant Alalakh and Chronology appeared, in which more archaeological and historical evidence was balanced together to give dates of 1792-50 B.C. for Hammurabi. For all essential purposes, Albright agreed to these dates. Then came the belated publication of the Khorsabad king list, wherein A. Poebel (Jour. of Near Eastern Studies, 1942-43) assessed the dates of Hammurabi's contemporary, Samsi-Hadad I of Assyria, as 1726-1694 B.C. In consequence, Albright (Bulletin of the American Schools of Oriental Research, 1942) reduced his dates again by 64 years (one Venus cycle, a factor in the calculations), thus setting Hammurabi's dates at 1728-1686 B.C.

This lowest dating had not yet been universally accepted in 1946, and Smith (Amer. Jour. of Archaeol., 1945) brought evidence of the coexistence, in a Cretan tomb of the M.M. I period, of a Babylonian cylinder seal of Hammurabi age and two 13th dynasty Egyptian scarabs, to support his earlier dating. Albright also maintained his later dating (Bulletin of the American Schools of Oriental Research, 1945) by means of both comparative archaeological and philological evidence. But whether Hammurabi mounted the throne in 1792 B.C. or 1728 B.C., the marked general depression in his date (from the 21st century B.C.) was sufficient to call for a depression in the dating of all west Asian and Aegean materials which had been bound to the old Babylonian chronology. It was Professor Albright's opinion that dates given in the Aegean (when derived from Babylonia) had been three to four centuries too high, and that even the Cappadocian tablets had been dated as much as six centuries too high. It may also be noted that the geographical range of the evidence noted here demonstrates most pointedly how internationalized the eastern Mediterranean world of the 18th century B.C. had already become.

Even for the war years and those just preceding them, many useful and detail-filling discoveries were made or published in the historic range; of these only the highlights can be treated. For Iran, E. F. Schmidt's The Treasury of Persepolis (1939) was a step forward in the knowledge of Darius' capital, as were also the details of Shahpuhr's inscription (Amer. Jour. of Semetic Languages, 1940). Remarkable Parthian statues in bronze were recovered from Shami, and R. Ghirshman excavated a Sassanian palace with mosaics, and a fire temple at Shapur. The Metropolitan Museum of Arts excavations at Nishapur produced the first early Islamic paintings ever found in northeastern Iran. J. Hackin's work at Begram, in Afghanistan, produced important Graeco-Roman and Oriental contact material, from the capital of ancient Kapisi.

The Indus civilization and periods subsequent to it became better known through E. Mackay's further work at Mohenjo-Daro, and by his publication of Chanhu-Daro (1943) for the Boston museum. This latter site included important post-Harrappan (Indus civilization) materials of the Jhukar and Jhangar periods. V. Gordon Childe (Antiquity, 1939) and S. Piggott (Ancient India, 1946) made useful summaries of the archaeology of this area.



For historic Mesopotamia, the final publication of the key Diyala sites, excavated by the Oriental institute's Iraq expedition, had been well begun; five volumes had appeared by 1946, dealing mainly with architecture and sculpture. H. Frankfort's Cylinder Seals (1939) set down the broad stylistic lines and chronological sequence of the important western Asian glyptic art. T. Baqir made significant excavations in the Kassite levels of 'Aqar Quf-Dur Kurigalzu, gaining partial plans of three large temples and information on the founding of the ziggurat. R. F. S. Starr's Nuzi report appeared (1937-39), with details of the sequence in this more northerly site at which a large area and many antiquities and cuneiform letters of the mid-second millennium B.C. had been exposed. I. J. Gelb's penetrating Hurrians and Subarians (1944) offered proof that these elements actually formed two different ethnic and political entities. The active Iraq Directorate of Antiquities reclaimed important later materials at Der, Wasif, Hajjoj and Samarra, adding to knowledge of Neo-Babylonian, Graeco-Roman to Sassanian and Islamic times, and the University of Michigan, Ann Arbor, Mich., continued the exposure of Selucia-on-the-Tigris. In the field of philology, S. N. Kramer's study and interpretation of the long neglected texts from Nippur revolutionized knowledge of one of the oldest higher cultures in the

In inland (Mesopotamian) Syria, the brilliant results at Mari have already been noted. M. Mallowan concluded his campaign at Chagar Bazar, and commenced important excavations at Tell Brak, near Hassetché. As well as earlier village material, written evidence was found to indicate that the site must have been an important trading centre in the time of Narâmsin. On the Euphrates, the long and important campaign at the Graeco-Roman city of Dura-Europus by Yale university, New Haven, Conn. and the Louvre, Paris, came to a successful close, and most of the final reports appeared. The later campaigns at Ras Shamra yielded public buildings, fortifications and administrative documents of great importance; philological work on the new Semitic documents from the site were of great literary and mythological significance. M. Dunand's complete publication of the new syllabic script from Byblos (Jebeil) was also of great importance. For the Graeco-Roman period, explorations in the vicinity of Antioch were continued under the committee from Princeton university, Princeton, N.J., the Louvre museum, and several U.S. museums; the Service des Antiquités continued its work on architecture of the same period at Palmyra.

Palestinian archaeology benefited by the appearance of W. F. Albright's excellent synthesis, From the Stone Age to Christianity (1940), and by the more popular What Mean These Stones (1941) by Millar Burrows and The Ladder of Progress in Palestine (1943) by C. C. McCown. The more important reports of specific excavations concerned four temples at Beth Shan (Beisan) illustrating Egyptian contacts with Palestine, N. Glueck's work at the industrial and port site of Tell el-Kheleifeh on the Red sea Gulf of 'Aqaba, C. H. Kraeling's edition of the architecturally important Gerasa publication, and B. Maisler's work on the late materials of Sheikh Abreiq. Gordon Loud's The Megiddo Ivories (1939) presented finds of greatest importance for the history of Phoenician art.

In Egypt, the fundamental work of W. B. Emery for the Service of Antiquities at Saqqara yielded new information

Detail of the gold garment of one of the chryselephantine statues dating from the 6th century B.C., found by French archaeologists at Delphi, Greece, in 1939. Restoration by Gilliéron (after the Bulletin de Correspondance Hellénique)

on the architecture, small objects, and especially copper implements of the 1st and 2nd dynasties. Z. Y. Saad also cleared about 735 1st dynasty tombs at Helwan. Striking new scenes appeared on a causeway to the pyramid of the 5th dynasty Pharaoh Unis, which promised to enlarge knowledge of royal ceremony at this early period. M. Chevrier of the Service of Antiquities reassembled the delicate little 12th dynasty shrine at Karnak. The most spectacular discoveries were those of Pierre Montet at Tanis, where tombs of several of the pharaohs of the 21st and 22nd dynasties featured an ornate art and a considerable amount of costly material. E. Drioton and J. Vandier's L'Egypte (1938) was an excellent detailed history; for the general reader, the most pleasing statement of the field was in G. Steindorff and K. C. Seele's When Egypt Ruled the East (1942).

One of the more important concluding statements of the Swedish Cyprus expedition was Erik Sjoqvist's Problems of the Late Cypriote Bronze Age (1940). J. F. Daniel's careful excavations at Kourion, in Cyprus, yielded examples of the last direct descendant of the Minoan linear script.

In Anatolia, Turkey, work in historic horizons proceeded at Bogazköy, Malatya, and Tarsus until interrupted by World War II. Important clearances were continued by the Turkish Historical society, and it was reported that H. T. Bossert's work in the first millennium strata of Karatepe, in Cilicia, would be of extreme significance. His Alt-Anatolien (1942) was an excellent summary with profuse and fine illustrations. Great papers by I. J. Gelb, B. Hrozny and P. Meriggi appeared in the field of Hittite hieroglyphics, and H. Güterbock and K. Bittel published important cylinder seals from Bogazköy and Troy. Blegen's important work at Troy, already noted above, also concerned the historic period.

The find of the period in Greece was Blegen's discovery, at Pylos, of some 600 tablets in early (Greek?) script. The archaic terra cotta sculptures and bronzes of Olympia were unusual, and the first chryselephantine sculptures ever to be found appeared at Delphi. Two wonderful new kouroi (youth sculptures) were discovered, and G. Richter's book, Kouroi (1942), appeared. The U.S. clearance of the Athenian Agora proceeded up to the beginning of World War II, and an important Mycenean tomb, as well as a wealth of detail on the classical period, were accounted for in preliminary reports in Hesperia. Work was resumed at the Agora by H. Thompson. The detailed reports on Corinth also continued. An important book was J. D. Beazley's Attic Red-Figured Vase Painters (1942).

The most remarkable work on Roman Italy was the culmination of the huge official project at Ostia by 1941, and A. Maiuri's continuing work at Herculaneum and Pompeii. At Herculaneum a small Christian chapel was found in an upper story room.

Accidental finds outnumbered planned excavations in Europe. G. Bersu's minute examination of the settlement site at Little Woodbury cast fresh light on the economy and sociology of pre-Roman Britain. By far the most spectacular discovery in western Europe during 1939, and one of the most remarkable finds ever made in England, was the ship grave of an Anglo-Saxon king found in the Sutton Hoo tumulus beside the river Deben in Suffolk. Careful excavation directed by C. W. Phillips revealed not only clear traces of the boat but also the outline of the ship itself—a vessel 82 ft. long and 16 ft. in the beam. The centrally located burial contained jewellery and per-

sonal belongings of barbaric splendour. The most impressive feature of the Sutton Hoo treasure was a set of provincial Byzantine plate; one magnificent silver dish bears the marks of the reign of the Emperor Anastasius I. It was suggested that the chieftain may have been Redwald, king of the East Angles (died c. A.D. 620), who was the first of his lineage to become high king of England.

B. A. Kuftin's work in the Trialeti province west of Tiflis testified to the vigour of Russian archaeological interest. The sites examined in this area ranged from the Copper Age to Sassanian times; great interest was connected with the Trialeti materials contemporary with Mycenean Greece.

The publication of the newly uncovered and conserved mosaics of Santa Sofia in Constantinople (Istanbul) was reported to be in press in 1946. Remarkable Islamic remains were cleared by D. Schlumberger at Kasr el-Heir al-Gharbi in Syria, with frescoes and stucco sculpture. Another important example of Islamic art and architecture appeared in the Umayyad palace site of Khirbet al-Mefjir in Palestine, and the 10th century summer palace of the Cordova caliphs in Spain was exposed.

For China (where the war began in 1937), Dr. Chen Meng-chia kindly supplied the following summary:

During the war all excavations were halted and a report on the Academica Sinica's work at Anyang was prepared. In 1945 a monograph called Liu t'ung pi lu was published. Three important articles by Shih Chang-Ju, excavator of Anyang, were included in this monograph. The general report on Anyang was awaited as a significant event in Chinese archaeology.

In 1938-39 the National Central museum made an excavation in Tali in northern Yunan province, publishing two memoirs in one volume; Report on an Archaeological Survey of the Ts'ang-erh District, Yunan, with an English summary. Part one is the report on four sites with 38 prehistoric residences. The earliest stage of the prehistoric discoveries probably corresponds with the Neolithic; the date of these sites is contemporary with Han or late Chou, two or three centuries B.C. Part two is a report on inscribed tiles collected at the foot of the Tien-tsang mountains. The inscriptions are in both Chinese and non-Chinese languages. They were probably made in the Nanchao kingdom, c. A.D. 738-902. This was the only scientifically excavated material concerning this culture of southwest China.

During 1927-33 the Sino-Swedish expedition made various excavations in northwest China. They found a great many bamboo and wooden slips at the capital of Ningsia province. These were the written documents of the Han dynasty. In 1943 Lao Kan of the Academia Sinica published a translation, and in the following year his researches, both very important in the study of Han history.

In 1944, Tung Tso-pin of the Academia Sinica published his work on the chronology of the Yin dynasty based on oracle-bone material found at Anyang. In the same year Chen Meng-Chia published a book on the chronology of the Western Chou based on bronze inscriptions and the "Bamboo Annals" found in A.D. 281.

The National library of Peking, in 1941, prepared to publish a series of archaeological researches edited by Chen Meng-Chia. About ten works had been put in press by 1946, but with the single exception of Chen's Chinese Bronzes in Foreign Collections, none had been published.

In 1940 the Peking office of the Harvard-Yenching institute published Jung Keng's The Bronzes of Shang and Chou in two volumes with 1,000 plates. The first volume is an introduction to the study of Chinese bronzes. In 1945 Chen Meng-Chia was sponsored by Harvard-Yenching to work on a corpus of the Chinese Bronzes in American collections for a period of two years.

In 1937 a catalogue was published in the Honan Provincial Gazette, containing 100 bronzes of Early Eastern Chou found in Honan province in 1923. In 1938 a catalogue of Hsün-hsien was published. These were bronzes of western Chou excavated by the Academia Sinica in 1932.

In 1936-37, a great quantity of lacquer, pottery, wooden sculpture and bronzes was found in Changsha. They were of the later Eastern Chou and Han dynasties. In 1937 Shang Ch'eng-tso was sent by the Institute of Chinese Culture Studies of the University of Nanking to investigate these finds. In 1939 he published An Account of Archaeological Excavations in Ch'ang-sha.

Before 1937, the excavations under various institutions placed major emphasis on the pre-Han period. During the war many Han tombs were found in Szechwan province. Full reports on these spectacular materials had not yet been published in 1946. (R. J. B.)¹

Western Hemisphere

In contrast to archaeology in the eastern hemisphere, the decade 1937 to 1946 inclusive was the most eventful in the history of American archaeology. Throughout the western hemisphere there was a florescence of archaeological research. The acceleration of research programs was the greatest the new world had ever known.

The socio-historical background of this accelerated archaeological research in the western hemisphere included an economic depression and a terrible war. Out of the depression was born the federal financing of archaeological projects in the U.S. in order to provide legitimate employment for thousands of unemployed men and women. More than \$1,500,000 was spent annually on archaeological projects in the southeastern U.S. alone. Moreover, the production of scientific data thus financed did not compete with established businesses and industries.

This federally financed archaeology in the U.S. not only made possible excavation and research on a scale previously undreamed, but also salvaged materials and information from important sites in areas later inundated as a result of the dams built by the Tennessee Valley Authority.

The federal financing of archaeology not only made possible excavation and research under the directorship of institutions that otherwise could not have afforded such programs, but also made possible the salvaging of materials and information from archaeological sites in danger of destruction from industrial expansion or agricultural activities.

Archaeology undertaken on such a large scale naturally developed techniques and methods somewhat different from those used previously. The most outstanding innovation was the development of assembly-line techniques for use in the field, but especially in the laboratory. The processing of archaeological information and materials was similar to the production methods of the factory.

This system was excellent for the collecting, analyzing and synthesizing of raw data, but was too rapid for the careful preparation of interpretative reports. As a result, much of the archaeological work awaited reporting and

¹The writer is especially indebted to W. F. Albright, Chen Meng-Chia, V. Gordon Childe, F. C. Cole, I. J. Gelb, D. E. McCown, M. B Smith, Mrs. Dorothy Thompson, F. O. Waage, S. S. Weinberg, J. A Wilson and G. E. Wright for helpful suggestions.

World War II.

While federally financed archaeology was being undertaken, private and state institutions were not idle. Many

Collier, Alfred E. Hudson and Arlo Ford (1942).

universities and museums carried out excavations and researches of the utmost significance, but on a somewhat

smaller scale than that of the federal programs.

While the depression was indirectly responsible for the archaeological boom in the U.S., the approach of war was indirectly responsible for widespread archaeological activity in Latin America. While hostilities were still confined to the eastern hemisphere, the strengthening of cultural relations among the western nations became not only desirable, but necessary. An ideal factor in strengthening these relationships was the bond of scholarship and interest in a common field such as American archaeologyburied history shared by all the nations of the new world. Consequently, with the objective of contributing both to pan-Americanism and archaeology, the Institute of Andean Research, supported by the art committee of the Coordinator of Inter-American Affairs, sent 12 archaeological expeditions to Latin America in 1941-42. There were, of course, many other significant archaeological investigations made in Latin America during the decade. Work undertaken by various institutions either in Latin America or in the U.S. contributed materially to the prehistory of Latin America. However, the activities of the Institute of Andean Research were outstanding for comprehensiveness and co-ordination.

In addition to the federally financed archaeological projects in the U.S. and the work of the Institute of Andean Research in Latin America, there were many other programs of research in the hemisphere. Some of these programs were new, others were continuations of long-term projects. Such programs were undertaken by universities, research institutions, museums, bureaus, local governments and (in Latin America) national governments.

More than any previous decade, the period 1937–46 was characterized by an awareness of problems and attempts to solve problems rather than random excavation aimed merely at discovery. For the first time in the history of American archaeology, the broad outlines of prehistory began to emerge on a continental scale.

Early Man.—The contemporaneity of the Paleo-Indian with glacial phenomena and animals now extinct was well established during the decade. Some additional Folsom finds were made and some new Paleo-Indian cultures were described such as the Cochise culture (Edward B. Sayles and Ernst Antevs, 1941) and the Sandia culture (Frank C. Hibben, 1941). An excellent summary of Paleo-Indian archaeology by Frank H. H. Roberts, Jr. was published in 1940.

Arctic America.—Henry B. Collins (1937) demonstrated the sequence of Eskimo cultures: Old Bering Sea, Punuk, Birnirk and Thule in northern Alaska. The newly-discovered Ipiutak culture was described by F. G. Rainey (1941). Ales Hrdlicka's reports (1944–45) presented cultural details from southern Alaska. The Dorset culture of the eastern Arctic was elaborated and extended through the researches of Canadian, Danish and English archaeologists. The most significant innovation in Eskimo archaeology was the successful introduction of dating sites by dendrochronology (J. Louis Giddings, 1944). A summary of Eskimo prehistory by Collins appeared in 1940.

Northwestern and Western North America.—P. Drucker (1943) reported the results of his survey of coastal British Columbia and outlined the available data of northwest coast archaeology. The results of research in the Columbia

Collier, Alfred E. Hudson and Arlo Ford (1942).

The prehistory of Indian California was presented in reports by Franklin Fenenga, R. F. Heizer, J. B. Lillard, W. R. Wedel and others. J. H. Steward (1940) sum-

marized the archaeology of the vast and little-known Inter-

montane (Great Basin) area.

Southwestern North America.—During the decade there was a considerable increase in the knowledge of the history of the three principal culture patterns: Anasazi, Hohokam and Mogollon.

Hohokam culture and periods were best described by H. S. Gladwin, E. W. Haury, E. B. Sayles and Nora Gladwin (1937). Some important contributions to Anasazi culture history were made by Ralph Beals, G. W. Brainerd and Watson Smith (1945); H. S. Colton and L. L. Hargrave (1937); Haury (1945); P. S. Martin (1938–39). H. P. Mera (1939–40); E. H. Morris (1939) and others.

Mogollon culture and periods were elucidated by Haury (1940, 1943); Martin (1940, 1942); and P. H. Nesbitt (1938). Important contributions to the solution of the problem of Navajo archaeology were made by E. T. Hall (1944) and Dorothy L. Keur (1941).

A brief summary of southwestern archaeology by Frank H. Roberts, Jr. was published in 1937. An elaborate sum-

mary by John C. McGregor appeared in 1941.

Eastern North America.—In this area the decade witnessed the emergence of archaeological interpretation from a state bordering on chaos to a recognition of the broad outlines of the prehistory of the region. Although much of the basic information was unpublished it was, nevertheless, generally known to all specialists working in the area. Over most of the region the archaeological evidence suggested a development from cultures based upon hunting, fishing and food collecting to cultures based upon agriculture. Particularly in the Mississippi valley, burial mounds and, later, pyramidal temple mounds were associated with the agricultural culture stages. Pottery, tobacco pipes, copper tools, weapons and ornaments, the bow and arrow, stone and shell hoes, and other artifacts or customs appeared at various stages of this cultural development. Important papers on these subjects were published by Fay-Cooper Cole (1943); J. A. Ford and G. R. Willey (1941); J. B. Griffin (1943, 1946), J. D. Jennings (1941); W. A. Ritchie (1944); W. Duncan Strong (1940) and

The Caribbean Area.—The distribution and succession of Caribbean cultures, almost unknown prior to the decade 1937–46, were described by C. Osgood (1942), F. G. Rainey (1941) and Irving Rouse (1939, 1941, 1942).

Mexico and Central America.—In Mexico new cultures were discovered and previously known cultures were augmented by additional finds or analyses. Among the significant reports of research in this area were publications by Alfonso Caso (1938), Philip Drucker (1943), G. F. Ekholm (1944), Isabel Kelly (1945), M. W. Stirling (1943), G. C. Valliant (1941) and others.

In Yucatan and Central America important archaeological researches were undertaken by a number of organizations, especially the Carnegie institution of Washington, D.C. Additional information about the famous Maya civilization was obtained and some new cultures were discovered. In addition to the reports of the Carnegie institution, some of the significant contributions to the archaeology of this area were C. L. Hay et al (ed.) (1940), J. M. Longyear (1944), S. K. Lothrop (1937), Doris Stone

(1943) and J. E. S. Thompson (1943).

South America.—Tremendous strides in the archaeology of South America were made during the decade. Particularly outstanding for its work in this field was the Institute of Andean Research. Although there were many excellent reports of South American archaeology by scholars of many different nations, all of the knowledge was excellently summarized in the Handbook of South American Indians edited by Julian H. Steward and published as Bulletin 143 of the Bureau of American Ethnology, Washington, D.C. This handbook was outstanding and unique. With archaeological contributions by Wendell C. Bennett, Junius B. Bird, Donald Collier, John M. Cooper, Gregorio Hernandez de Alba, Alfred L. Kroeber, Rafael Larco Hoyle, Henri Lehmann, Samuel K. Lothrop, John Howland Rowe, Luis Valcarcel, Gordon R. Willey and others, all of the known prehistory of South America was made easily available for the first time. (See also ANTHROPOL-OGY.)

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ARCHERY

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Archery

Archery as an organized sport had its beginnings in the United States in the first half of the 19th century, but it was not organized on a national scale until 1879, when the National Archery association of the United States was formed to promote and direct the sport and to hold an annual tournament to determine the archery championships of the United States.

Except for the war years of 1917-18 of World War I and the war years of 1942-45 of World War II, the National Archery association held a championship tournament each year after its organization. In these tournaments the shooting, except for flight shooting, was along the lines of traditional target archery, in which the contestants shoot at standard 48-in. targets placed at prescribed distances from the shooting line, the men shooting the York round (72 arrows at 100 yd., 48 arrows at 80 yd. and 24 arrows at 60 yd.), and the American round (30 arrows at each of the distances 60 yd., 50 yd. and 40 yd.), the women shooting the National round (48 arrows at 60 yd. and 24 arrows at 50 yd.) and the Columbia round (24 arrows at each of the distances 50 yd., 40 yd. and 30 yd.), and those in the Junior division shooting the Junior American round (30 arrows at each of the distances 50 yd., 40 yd. and 30 yd.) and the Columbia round.

Within the decade 1937-46 there developed a widespread interest in field archery, as distinguished from target archery. The term "field archery" in its broadest sense included roving, so-called "archery golf" and hunting, in addition to the competitive event to which the word "field archery" was commonly applied. In this competitive event a plurality of targets, often of varying sizes, were placed at different locations on the field and the competitors proceeded over the course from one target to the next in regular order, shooting at each target in turn. A shooting line was laid out for each target and the distance between the shpoting line and the target varied with different targets.

The interest in field archery grew so rapidly that in 1939 the National Field Archery association was organized, one purpose of which was to determine the field archery championships of the United States each year.

In the championship tournaments of the National Archery association during the decade, new records were repeatedly established, so that the 1946 record in each round was well advanced over what it had been ten years before.

National Round Records

	140	ational kouna kecoras
		Single Round
Year	Record	Record Holder
1936	71- 471	Gladys Hammer, Los Angeles, Calif.
1938	72- 492	Jean Tenney, Clear Spring, Md.
1940	71- 513	Ann Weber, Bloomfield, N.J.
1941	72- 522	Mildred E. Miller, Milwaukee, Wis.
	1	Double Round
1936	140- 882	Ilda Hanchett, Inglewood, Calif.
1937	141- 883	Gladys Hammer, Los Angeles, Calif.
1938	141- 939	Jean Tenney, Clear Spring, Md.
1940	143- 979	Ann Weber, Bloomfield, N.J.
1941	144-1010	Mildred E. Miller, Milwaukee, Wis.
1946	142-1026	Ann Weber, Bloomfield, N. J.
		Columbia Round Records
		Single Round
1936	72- 550	Olive Bescoe (Mrs. Olive Bescoe Laye
55	, 55	Clarendon Hills, Ill.

Year	Record	Record Holder
1938		Jean Tenney, Clear Spring, Md.
1940	72- 550 72- 582	Ann Weber, Bloomfield, N.J.
1941	72- 584	Ree Dillinger (Mrs. Ree Dillinger Diet-
-94-	12 504	rickson), Summit, N.J.
6		Double Round
1936	144-1082	Gladys Hammer, Los Angeles, Calif.
1938	144-1088	Jean Tenney, Clear Spring, Md.
1940	144-1148	Ann Weber, Bloomfield, N.J.
1941	144-1148	Ree Dillinger (Dietrickson), Summit, N.J.
1946	143-1159	Ann Weber, Bloomfield, N.J.
		York Round Records
		Single Round
1936	134- 792	Gilman Keasey, Corvallis, Ore.
1938	139- 813	Pat Chambers, Portland, Ore.
1940	138- 816	Marvin T. Schmidt, Chicago, Ill.
1941	141- 827	Larry Hughes, Burbank, Calif.
		Double Round
1936	267-1549	Gilman Keasey, Corvallis, Ore.
1938	262-1614	Pat Chambers, Portland, Orc.
1941	279-1637	Larry Hughes, Burbank, Calif.
31		nerican Round Records
	-17	Single Round
1041	00- 511	Larry Hughes, Burbank, Calif.
1941	90- 744	
	-06.	Double Round
1941	180- 464	Larry Hughes, Burbank, Calif.
		Junior Division
	. Si	ingle Columbia Round
		Girls
1940	72 - 516	Mary Thompson, Phoenix, Ariz.
1941	72- 516	Mary Thompson, Phoenix, Ariz. Dorothy Axtelle, Tacoma, Wash.
	Singi	le Junior American Round
	0	Boys
1941	90- 720	Paul Cowin, Bethlehem, Pa.
-34-	· .	
		ele Junior American Round
1941	180–1426	Billy West, Joplin, Mo.
		Flight Shooting
		Men
		Regular Style
1939	517 yd. 1 ft.	
1946	521 yd. 11 in	. Herbert Henderson, Evansville, Ind.
-31-	J /	Free Style
1936	614 yd. 6 in.	Curtis Hill, Dayton, O.
	658 yd. 2 ft. 8	
1946	050 yd. 2 1t. (
		IVomen
		Regular Style
1936	322 yd. 6 in.	Hiawatha Crosslin, San Marco,
		Tex.
1937	355 yd. 2 ft. 4	
1946	434 yds.	Millie Hill, Dayton, O.
		Free Style
1937	406 yd. 1 ft. 1	
		Wis.
1946	564 yd. 6 in.	Mrs. Cecil Modlin, Evansville,
		Ind

When it was decided to cancel the National Championship tournament in 1942, the National Archery association inaugurated a series of nation-wide contests by mail, which were continued each year thereafter. These contests included a clout shoot, a target shoot and a flight shoot. All of these events were enthusiastically received, and in the 1942 target shoot over 1,000 archers participated.

Ind.

During the war years the competitive events sponsored by the National Field Archery association were in the nature of mail matches. In 1946 this organization held its first annual championship tournament at Allegan, Mich., with 476 field archers participating. In this event the men's field archery championship was won by Erwin C. Pletcher of Bakersfield, Calif., the women's championship by Mrs. H. A. Bitzenburger of Los Angeles, Calif., the junior boys' championship by M. LeFavour of Fort Wayne, Ind., and the junior girls' championship by Kathleen Powell of Portland, Ore.

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Architects, American Institute of

See Societies and Associations.

Architecture

Architecture reflects the civilization of an age. Buildings are planned for the needs of a people and are created out of the current thought and spirit of the times.

The contrast in the architectural expressions of buildings during the ten eventful years 1937–46 mirrored the conflict in social ideologies throughout the world. Two fundamental concepts of architecture were opposed to each other—the traditional and the modern. The sway in popularity from one to the other with occasional reversals, the growth of one style and decline of another with some levelling of the clashing contrasts between them showed that the architecture of that period belonged to a world in a time of transition. The motivating forces to change and progress were the diverse movements toward social betterment, the accelerated progress in science and industry and the changing attitudes toward the past.

Traditional Architecture.-The strength of traditional architecture lay in its harmony with the past. It carried on historic styles or evolved its own style along classic principles. The patterns were familiar to the public, and the formulae of designs were the old routine of architects. There was a striving for monumentality and ostentation which found visual appeal with the masses. Symmetry and proportion based on classic discipline suggested order. The residential designs continued the familiar motifs of conventional styles, at times transplanted from the old world to the new or from one region to another. The outward characteristics were those derived from masonry architecture: solid-appearing walls with small windows and doors; surfaces broken by cornices, columns, pilasters and ornamentation. The interiors were rigidly enclosed by architectural treatment that carried around the enclosing walls to tie in the fenestration. Machine production was used to imitate the work of old craftsmen. Functional and utilitarian requirements gave way to the dictates of styles.

The national styles of the U.S.S.R., Germany and Italy were all traditional in that historic forms and classic doctrines were used in their designs. In this category also belonged the various eclectic styles, neo-romantic, neoclassic, and Neo-Gothic, which applied the motifs of traditional styles with modifications suited to the taste of the times and place of building.

Modern Architecture.—Modern architecture was not a style, but a new concept of design which stood for a rational approach to contemporary building problems. It strove for honesty in the expression of functional requirements, for achievement in construction, for utilization of new processes of building and modern materials offered by industrial and scientific progress.

From an aesthetic point of view, modern architecture concerned itself foremost with the design of space in contrast to the traditional emphasis on façades. The modern approach attacked the shaping of a building from the inside out. Thus, the modern concept gave a new freedom to design; neither the dictates of obsolete systems of construction nor the rules for traditional design derived from them were permitted to interfere in the shaping of the spaces. Steel, concrete, or wood framing, particularly the use of skeletons of columns supporting girders and floor

or roof beams, allowed the insertion of walls at will. The fusion of rooms by the elimination of unessential dividing walls resulted in the "open plan." The phrase, "bringing the landscape into the house" referred to the use of sheets of glass in place of exterior walls for the purpose of a merger between the outdoor and indoor spaces.

Simplicity and a functionally honest design expression, combined with an absence of ostentation and ornamentation, were the apparent characteristics of modern architecture. The design forms were distinguishable by their building masses of cubes or prisms, often interpenetrating; by plain and thin enclosing walls with large areas of glass. The roofs were commonly flat or slightly pitched in one or two directions.

"Functional architecture" was the name most commonly given to the style of design resulting from the modern concept. Frank Lloyd Wright, striving for a fuller expression of all phases of design and placing greater emphasis on aesthetics and the interpretation of life in art, identified his own work as "organic design." The name "international style" was given to the early forms of modern architecture which appeared with identical characteristics throughout the world. "Regional styles," in contrast thereto, adjusted the modern characteristics to the climate, the building materials and the habits of people in various regions.

The "modernistic style" had nothing in common with modern architecture, but was often confused with it. It represented a decorative approach to design traditional in basic concept, which used great abandon in the application of motifs devoid of classic discipline (bay or corner windows, etc.) and ornament of bizarre forms.

History of the Modern Movement.—The dawn of a new architectural concept had come in Europe with the beginning of the 20th century. The movement toward a new architecture was foreshadowed in the works of isolated architects—in the United States, Louis Sullivan and Frank Lloyd Wright; in Belgium, Henri Van de Velde; in Germany, Peter Behrens, Joseph Olbrich and others; in Autria, Otto Wagner and Adolf Loos; in France, Auguste Perret. The spirit behind these scattered attempts to break with the rigid codes of historic styles kindled the flames of revolt.

This architectural revolution had burst forth after World War I. The calamity of destruction resulting from the strife between nations had shaken the faith in the past. Reigning dynasties had been abolished and a new social consciousness had been aroused. The Industrial Revolution had progressed to the point at which machines had vastly influenced daily life and the technique of building. Thus opportunities to the rise of new thought and experimentation were opened. This new spirit fanned the sparks of revolution into a movement toward a new architecture. The most pronounced agitation for an architectural revolution appeared in the Vers une Architecture (1924), of Le Corbusier (Charles Edouard Jeanneret). In Germany, the movement entered into the teaching of architecture and allied arts at the Bauhaus (in Weimar and later in Dessau) founded by Walter Gropius. Architects from many countries united for the promotion and development of modern architecture.

This new architecture had its roots in social and economic changes. The concern of architects for social betterment supplanted the previous interest in providing for luxury and wealth. Housing, buildings for health and welfare and recreation became of tremendous importance.

Frank Lloyd Wright, in common with the pioneers of the new movement of Europe, attacked outworn architectural conventions. To him, romanticism in art expressed liberation from the dogmas of the styles of the past. Arguing against functionalism, he expressed the belief that all great architecture must transcend in its visual form the expression of practical necessities, and that a functional solution of a building problem must become merely the framework to the artistic creation. He was not a logician but a poet, yet through intuition and feeling he produced a fusion between analytical experiment and invention.

Le Corbusier called architecture "the aesthetics of engineering." He argued that architecture was in an unhappy state of retrogression, the old architectural styles having lost their reason for existence with the rise of a new style of steel and concrete. This change to him signified the revolution in architecture. Walter Gropius, in his Theory and Organization of the Bauhaus, published in 1923, pointed to the devitalizing influence of the academies of art and sought in his approach to design the basis for a reunion between the creative artists and the industrial world.

Transition.—The international expositions of 1937 and 1939 served as a record of architectural thought in the various countries. They provided an opportunity to display the new and to represent the work of the outstanding talent among different nations. For these reasons an interesting demonstration of the conflicting ideologies and approaches to architectural design appeared, first at the Paris International exposition of 1937 and later at the New York exposition of 1939.

The Paris exposition presented a representative cross section of national trends in architecture. It was interesting to note that the national pavilions of the U.S.S.R. and Germany achieved an almost identical effect of aggressive, massive force. The German building adapted classic modes to its own ends. The Russian building was a streamlined pedestal for a gigantic statue of two workers.

In the New York exposition of 1939, several other ideologies appeared. The U.S. buildings showed the influences of advertising and display technique on architecture. The pavilion of France reflected the fondness for decoration typical of the French people, and also an unfortunate decline to an artistic confusion. In contrast thereto, Brazil's modern pavilion portrayed a fresh spirit, and the smaller countries, Sweden and Finland, were represented by architecturally distinguished buildings indicating a native strength in design.

The nationalistic ideologies of the totalitarian countries in Europe reflected themselves in an establishment of national styles. The Russian, German and later the Italian governments exercised direct control over architectural designs. Modern architecture was scorned and forbidden by laws. Architects were robbed of their freedom to design in new forms and to develop further the promising start modernism had in those countries. This resulted in a migration of the most influential proponents of modernism to the democracies.

In Germany, Italy and the soviet union, propaganda architecture was important and provided forums for mass meetings and striking architectural decorations for state visits. Military architecture produced defense lines, and theories on bomb-proofing for towns and buildings were tested. Preparation for war became noticeable. In England and the United States, the progress of modern architecture was accelerated by the modernists from the totalitarian countries who found refuge there.

The beginning of war in Europe in the fall of 1939 arrested all normal architectural progress on the continent and in England. In the latter country, the growth of the

new architecture continued for a while, motivated by the influences of the newly arrived European architects. The year 1940 will be remembered for the beginning of the wanton destruction of architecture by aerial bombardment. The German invasion of France disrupted the artistic influence of that country. No longer was it possible for foreigners to go to the École des Beaux Arts in Paris for study. The American School of Art at Fontainebleau was closed. The French, English and American academies in Rome gradually shut their doors, ending at least for the time being the classic influence on architectural education. Only in the Americas, Palestine or the colonies did European influences contrive to be felt through the activities of refugees. By 1940, with the U.S. absorbed in lend-lease production and defense preparations, a period of important architectural development which had extended between two wars approached its end. After the United States entered World War II in 1941, practically all building activities throughout the world were devoted to the needs of the armed forces, the production of war materials, the housing of war workers, and the most urgent requirements for the safety, health and welfare of the civilian populations. Only the Latin American countries continued to carry on sufficient building to prolong the progress in modern architecture.

The architecture during the World War II period became utilitarian in character. Its visual form grew out of the temporary nature of buildings designed for the duration of the war, out of shortages in materials and manpower, and out of the speed and efficiency demanded by the war effort. As the war progressed into 1942, 1943 and 1944, postwar planning received ever-increasing attention. It had become necessary to plan for, and to demonstrate through public exhibitions, the opportunities for better living that could be created in peacetime. Likewise, it was important to prepare plans for the absorption of manpower that would be released by the end of the war. The new concept that architecture could serve society by aiding in the planning of a better world took hold. A profusion of plans for towns and regions were made; official reports, literature, propaganda pamphlets, advertisements and exhibitions of postwar proposals appeared. Progress in architecture took place on paper.

The first postwar months in 1945 and 1946 brought little encouragement for actual building. The effects of the global strife were too great to permit the immediate return to normalcy in architectural practice. The problems of readjustment in the dislocations resulting from the war, material and manpower shortages, combined with a considerable rise in construction costs, delayed the execution of most projects. The accumulation of blueprints prepared in the war years as an aid to re-employment during demobilization remained temporarily unused. While building activity in the U.S. and the neutral countries was delayed by these knotty problems of reconversion, the warring countries of Europe and the orient suffered from so large a destruction and disruption that all building other than that of an emergency nature remained at a standstill. The great immediate need was housing and emergency repairs of the damages of war to make conditions of life bearable.

Planning and Design.—A scientific attack of the problems arising in building design supplanted the emotional approach. Building plans were dictated by functional requirements which, in turn, governed the aesthetic form. Architects were called on to delve deeper into the needs

of their clients to provide for the most efficient operation of the building they were designing. Their attention was focused on the improvement of working and living conditions. The basic requirements of the human being for health and comfort were analyzed. Space demands for many building types were calculated; cost, rent and income studies commonly preceded the preparation of the construction drawings.

Looking toward a new era of building, architectural periodicals and popular magazines devoted much space to the comfort and luxuries possible in postwar houses. "The Houses of Tomorrow," as they were commonly called in U.S. books and exhibits, featured glass-walled living spaces, elaborately built-in storage provisions, richly appointed kitchens with a multitude of labour-saving devices, and a variety of extravagant installations for television receivers and moving picture displays and so forth. In the design of housing for workers, low cost was mandatory. Toward this requirement, dwelling units were reduced to smaller but efficient sizes, and mass production processes were employed in construction. Housing became a separate fieldin which the co-operation of town planners, sociologists, experts in government, finance and construction was demanded. (See Housing; Town and Regional Planning.)

Public schools, kindergartens and nurseries and other educational facilities were greatly influenced by the progress in educational methods. Greater flexibility in educational structures to permit periodic changes in educational programs became evident. Daylight, artificial illumination and the acoustic properties in school buildings were improved. The demand for interior space in U.S. schools was greatly increased by a need for the enlargement of the school lunchroom facilities and a fuller athletic program. The school grounds were extended to provide more play space, parking facilities and better planting.

Commercial buildings were designed to bring a high return in rental. Office buildings provided for a greater variety of rental space, following the principle established at Rockefeller centre in New York, where restaurants, theatres, garages, exhibition spaces, shops and broadcasting studios were combined into a successful operating entity. Stores were greatly aided in their design by the development of unbreakable glass. Metal and wood, which formerly had to be used in the doors and for the support of the show windows, were eliminated. The show window, which was previously a narrow strip of display space blocked off from the store, disappeared and the entire store was converted into the display area.

In theatre design, the era of the gigantic motion picture houses ended in 1930 with the construction of the Rockefeller centre theatre of 6,000-seat capacity. Thereafter, greater emphasis was placed on the building of smaller and more intimate neighbourhood theatres, particularly where parking facilities as an integral part of the theatre property were feasible. Plans were made for prefabricated motion picture houses which could be produced in the U.S. and shipped to various parts of the world. Progress in mechanical devices, in lighting and acoustics, allowed unusual flexibility in the design of theatres for plays and spectacles. The stage house and the auditorium could be enlarged or changed at will by movable walls, and rising, lowering and revolving floor sections. The application of such ingenious devices in modern theatre planning was demonstrated at a theatre in Malmoe, Sweden. Invariably the shape of the auditorium was determined out of a study of acoustic properties and sight lines.

In industrial architecture, the one-story factory established itself as the prevalent type, following the manufacturers' desire for large, clear floor areas unobstructed by columns, stairs or elevators. Buildings allowed for the proper "flow" in production and the changes demanded for retooling or the shift to new products. Windowless as well as daylight plants were built. Progress in fluorescent lighting and air conditioning made the design of windowless factory buildings practicable. Under the consideration of wartime blackouts, night shifts and the heating effects of solar radiation through glass areas, this type had many advantages to offset its increased initial expense, but met with psychological objections from the workers. Toward the end of World War II, more industrial buildings were designed as semi-daylight plants, in which just sufficient windows were incorporated to provide a visual contact with the out-of-doors. Workers' comfort received greater consideration. Recreation rooms, more spacious locker rooms and attractive cafeterias were provided.

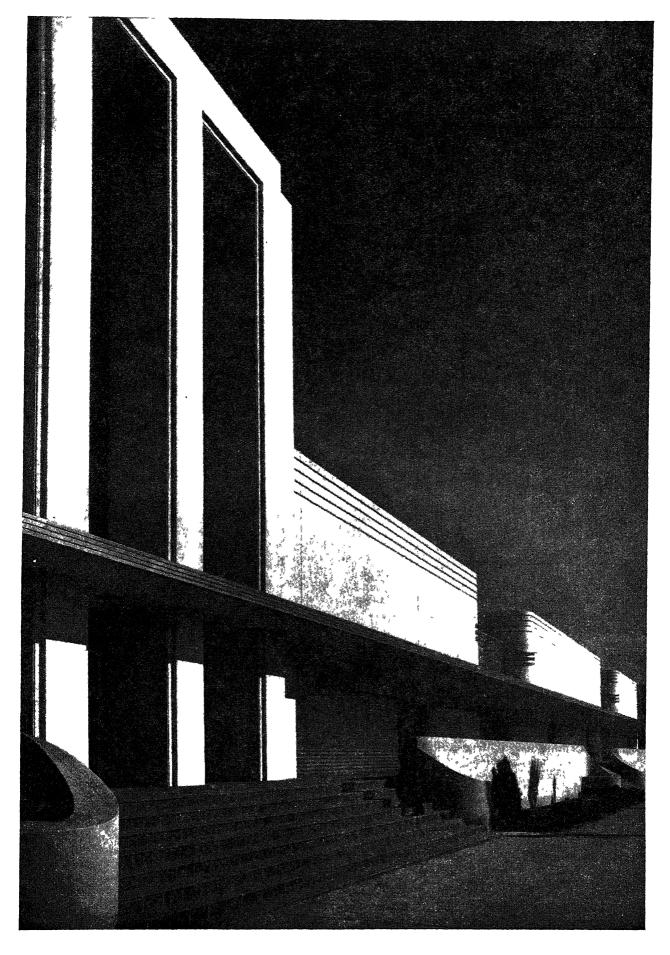
Medical institutions took on a new significance in architecture with a growing emphasis on social betterment. They ranged in size from small neighbourhood health clinics to average city hospitals and large health centres. The latter grew to unprecedented capacity, providing elaborate facilities for the treatment of patients numbering up to 3,000 and over. While fireproof materials were still available, multistory construction with centralized kitchens established itself as the prevalent type. During the war, while the demand for hospital facilities greatly increased, steel and concrete were harder to obtain and it became necessary to return to the pavilion-type plan, which resulted in buildings of nonfireproof construction one or two stories high, spread over large tracts of land. The extraordinary progress in medicine and surgery demanded substantial changes in hospital planning to permit the application of epoch-making discoveries under the best possible conditions.

Techniques and Materials.-Over a period of time, building processes had shifted from the building site to the factory. First timber came pre-sawn; later, finished doors and windows were obtainable. Finally, the continuing progress in building technique caused the reduction of field work solely to site preparation, foundations and assembly of factory-built parts. This was first accomplished in small-house construction, and then in school buildings and other larger structures. Prefabricated wall, floor and roof panels, partitions, stairs, etc., were commonly used. Assembly of prefabricated parts also allowed demountability, thus making possible internal changes, enlargement and relocation of buildings with a minimum of waste. Shop fabrication demanded a standardization of measures for the various components of buildings. A modulus of 10 cm. was used as the basic measure in Russia, and 4 in. as basis to the dimensioning of building materials in the U.S.

Throughout construction existed a trend to reduce weight. In steel construction this was made possible by welding, in concrete by prestressing reinforcing bars, in wood by laminating of thin members into beams and girders, or by the use of metal connectors between light timbers.

The development of new materials resulted from efforts

Modernism in architecture resolved itself during the years preceding World War II into functionalism both in design and in materials used. Excess details were eliminated and the decorative element made a part of the structural pattern itself. The NBC studios in Hollywood, Calif., represent the transition from the decorative façades typical of the Beaux-Arts school of Paris to true modernism



to reduce the cost of construction through savings in labour costs; from a search for cheaper substitutes for the older building materials; and from a demand for new decorative treatments. Plywood became a prominent new material which was used for interior and exterior wall surfaces, and for a vast range of decorative and structural purposes. It was glued to timber to carry stresses (skinstressed plywood construction). The development of twodirectional bending of plywood for aeroplanes brought moulded plywood surfaces to building and furniture making. Resin bonding agents rendered plywood waterproof, making exterior application possible. A vast variety of wallboards served as new surface coverings, substituting for plaster and permitting dry construction. The latter allowed the acceleration of the construction process and facilitated prefabrication of wall and ceiling panels. Development of new adhesives and various compounds to assure the tightness of walls and roofs allowed simplification in the methods of construction. Paints, preservatives, fireproofing agents for wood, as well as new waterproofing compounds, signalized profound changes. A great variety of new insulants made the thin and light wall and roof construction possible. Glass underwent profound changes. Through heat treatment it was rendered unbreakable for use in doors and furniture. By the addition of chemical substances the penetration of heat rays through window glass was combated. A spongelike material of unusual lightness in weight and great rigidity, known as foam glass, was developed for insulation purposes, along with a whole variety of glass wools.

In the field of building equipment, fluorescent lighting constituted the most important change after the invention of the filament lamp. The heating of buildings through warmed floors and walls, known as "panel heating" or "radiant heating," was increasingly accepted in design.

An ever-increasing number of mechanical conveniences were developed which played a large role in adding to the comfort and reducing labour in the homes. Prominent among the new appliances were cooling units, food freezers, automatic laundry equipment, automatic control devices for heating, air cooling, air cleaning and humidification. Industry revolutionized the designs of kitchens and bathrooms. Prefabricated units for both of these rooms came into use.

Architectural practice underwent corresponding changes. The great complexity of the planning and design process demanded the co-operation of specialists in the fields of architectural design, structural and mechanical engineering, cost estimating, etc. The mechanical installations for heating, ventilating, sanitary equipment, illumination and acoustics became increasingly intricate and costly. The architect's position was that of a co-ordinator. A large amount of drafting and detailing was required to convey the quantity of intricate information demanded for the industrial production of the building parts formerly cut and fitted on the construction site.

The war demanded that construction of industrial plants and military installation proceed with unusual speed. Factories as large as 35 ac. were planned and built in the U.S. in as little as three months. Germany and the U.S.S.R. likewise carried out gigantic projects in record time. This resulted in a concentration of a great number of specialists and technicians in one office, and the rise of larger organizations and huge architectural bureaus of governments. Governmental regulation and standardization were on the increase.

Architecture in Great Britain.—An important architectural advance in England in 1937 was demonstrated by the apartments at Highgate, London. These were functional in plan, modern in construction and design. In 1938, Highpoint No. 2 was built at Highgate (Tecton, architects), which showed the same modern functionalism but with a greater concern for decoration. Throughout the country, unusually large medical institutions came into existence, such as the Birmingham Hospitals centre. These showed a universal preference for high buildings in contrast to isolated pavilions.

The British Empire exhibition at Glasgow, Scotland, followed the modern design trend and in several buildings echoed the Paris exposition of 1937, and as an example of architecture along traditional lines there arose the new and imposing city hall of Norwich.

In 1939, the Health centre for the borough of Finsbury, by Tecton, showed the part architecture had begun to play in the organization of social services. The expression of a modern social need was also given in the Impington Village college of Cambridgeshire, Walter Gropius and Maxwell Fry, architects. For official architecture, traditional designs were preferred, demonstrated by the new government building of Edinburgh (Thomas S. Tait, architect) and the town hall at Wolverhampton (E. D. Lyons and L. Israel, architects).

During the blitz, air-raid precautions became of major concern to architects. Efforts were directed toward camouflage, protection against damage from bombing and erection of evacuation camps for children. Some buildings planned for social needs before the war were completed, such as nurses' homes, health clinics, a working-girls' club and sport pavilions.

Through 1941, architects in private practice were engaged in the construction of hospitals, hostels, camps, stores, etc., the development of air-raid shelter schemes and government buildings. They reported on air-raid damage and advised on the safeguarding of historic buildings.

In 1942, attention was drawn to a master plan prepared for the rebuilding of London by the Modern Architectural Research society (M.A.R.S. group), and later to pictorial illustrations accompanying the designs for the future capital of the empire by Sir Edwin Lutyens, architect, and Sir Charles Bressey, planner, prepared under the sponsorship of the Royal academy.

The architectural activity of 1943 was primarily devoted to further plans for the rebuilding of Great Britain. The County of London plan, prepared by J. H. Forshaw and P. Abercrombie at the request of Lord Reith, minister of works, proposed a 50-year program aimed at the repair of war damage combined with improvements to obsolescence, bad and unsuitable housing, inchoate communities, uncorrelated road systems, industrial congestion, low level of urban design, inequality in the distribution of open spaces and increasing congestion. The plan for the reconstruction of Coventry also aimed to create order out of disorder and destruction.

A temporary quality of design which war necessity gave to architecture was shown in a hostel for British war workers, F. R. S. Yorke, architect. Public buildings were expressed in classic monumentality with motifs somewhat influenced by Swedish architecture.

In 1944, England suffered another period of devastating bombing by the V-1 and V-2 bombs. This resulted in more destruction of buildings, with a great loss of homes. Thus in 1945, with the return to peace, private building enterprise and public effort joined in an effective working partnership to meet the urgent housing needs. The new

Labour government viewed the temporary housing construction with considerable disfavour, and based its future policy on plans to concentrate all energies on permanent housing.

United States.—In 1937 and 1938, a good deal of building was in progress, such as the Rockefeller apartments in New York city and the Williamsburg housing project in Brooklyn, N.Y. Many of the European architects had already arrived in the U.S. to teach and practice architecture in the east and middle west. The influence of Walter Gropius and Miees Van der Rohe was beginning to be felt in architectural education and practice. Greater acclaim had come to the U.S. architect, Frank Lloyd Wright. He had risen to new heights in his residential building, "Falling Water," at Bear Run, Pa., and the S. C. Johnson company building at Racine, Wis.

The procurement division of the treasury department was engaged in the design and execution of an unusually large number of public buildings. Unit Plans, a publication of the U.S. Housing authority, established housing standards. A controversy between modernism and traditionalism flared up over the classic design for the Jefferson memorial at Washington, D.C. The following year the New York World's fair and the San Francisco Golden Gate International exposition were held. These two expositions showed the influence of business and industry on U.S. architecture through a profusion of commercial exhibits.

In the residential field, the modern houses of Frank Lloyd Wright, William Lescaze, Richard Neutra and Walter Gropius aroused interest. The building for the Museum of Modern Art in New York showed functional theories applied to U.S. conditions. The winning design, submitted by Eliel and Eero Saarinen, J. Robert F. Swanson, associates, in a competition for the Smithsonian institution in Washington, D.C., stood in contrast to the traditional architecture seen previously in government buildings.

In 1940, architectural development was more or less carried on alone by the U.S. The New York World's fair went into its second year, adding some new installations and showing interiors of modern homes which had found popularity surprising to the traditionalist. The battle between modern and traditional architecture was kept alive by comparative displays in an exhibition entitled "Versus," held at the Architectural league in New York. The premise that buildings are integral parts of communities and that architectural design does not stop with the walls of a building was shown in theory in the exhibition "Telesis" at the San Francisco Museum of Art, and in practice by the parkways, parks, bathing beaches, bridges and tunnels executed in New York under the direction of Commissioner Robert Moses.

The role of the automobile in modern living conditions was taken into account and parking provisions were incorporated. For example, parking was provided on the roof of a store building for Sears Roebuck and Co., at Los Angeles, Calif., John S. Redden, architect and John G. Raben, designer, and a church was proposed for Kansas City, Mo., by Frank Lloyd Wright, with space for automobiles on several levels. A clear expression to functional requirements was also seen in the Lake County Tuberculosis sanatorium at Waukegan, Ill., William A. Ganster, W. L. Pereira, architects.

By 1941, construction contracts had indicated the largest volume of building for any year after 1929. This was, however, limited to the fields of military construction, industrial building and housing for defense workers. The housing project at Indian Head, Md., was built with an

eye to experimentation and demonstration of prefabrication for future residential buildings. At Grand Prairie, Tex., demonstration showed that an entire building could be erected and completed on the site in one day. Houses of cylindrical and domed forms were proposed as new answers to the problems of prefabrication and low-cost housing. Buckminster Fuller showed how a mass-produced steel grain bin could be converted into a demountable house. Independent practising architects were given the opportunity to design dwelling units for workers in defense industries. The size of these projects ranged from 20 to several thousand family units. One of the largest of these projects was at Vallejo, Calif., William Wurster, architect.

The U.S. entry into World War II caused war construction to increase tremendously in 1942. In Washington, D.C., the army engineers completed the Pentagon building, a five-story structure of unprecedented extent, providing 4,000,000 sq.ft. of office space. The Willow Run bomber plant of the Ford Motor company in Michigan, Albert Kahn, associated architects and engineers, became one of the largest industrial projects undertaken during the war. The Austin company built a bomber plant of gigantic dimensions, with wall and roof surfaces lined with a material which accomplished both thermal insulation and sound absorption.

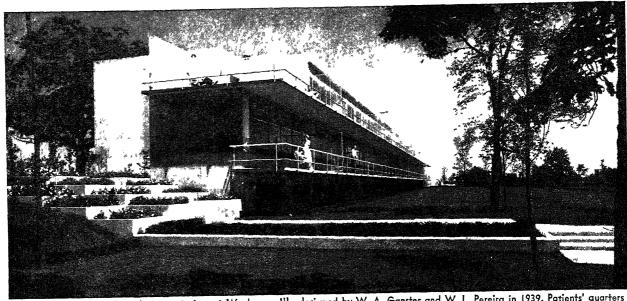
Housing for war workers consisted not only of dwellings but also of community buildings for administration and recreation, stores, schools, etc. School buildings were prefabricated for Federal Works administration projects at Carquinez Heights, Vallejo, Calif., and at Pacific Beach, San Diego, Calif., Franklin and Kump, architects.

Stringent governmental control in 1943 permitted the building of only the most necessary war plants, housing for war workers, construction for military needs and the erection of other buildings essential to the safety and welfare of the public. Housing for workers at the Ford bomber plant at Willow Run was solved by trailers, prefabricated single and multiple-family houses and dormitories.

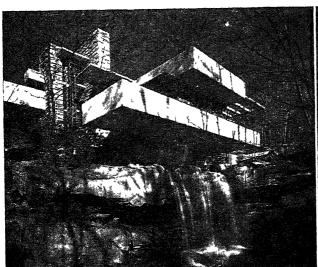
As a result of the steel shortage, the welfare building at the naval training station at Great Lakes, Ill., Skidmore, Owings and Merrill, architects, used laminated wood beams for long spans. A new trend in development in hotel design was exhibited by the Statler hotel in Washington, D.C., Holabird and Root, A. R. Clas, associated architects. In this building, the public lobby was broken up into a series of intimate spaces and segregated into the functions of lounging, transaction of hotel business and circulation. The guest rooms were furnished in the character of living rooms.

The house of John B. Nesbitt at Brentwood, Calif., Richard Neutra, architect, was indicative of a trend of departure from the severe character of the earlier functional style of architecture. A certain artistic freedom akin to poetry was introduced into modern architecture.

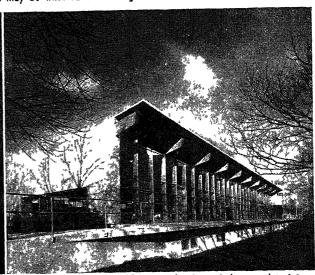
By 1944, plans for postwar buildings were under way. In New York, the city held an exhibition showing its future building program, and an exhibit entitled "Art in Progress" was held at the Museum of Modern Art. The functional requirements of industrial building resulted in a modern expression. Fenestration, which had been omitted in various war plants, reappeared in the U.S. naval ordnance corps at Forest Park, Ill., Albert Kahn, associated architects and engineers, and in the Fontana Steel Mill in California, as the realization grew that some



Above: Lake County Tuberculosis sanatorium at Waukegan, Ill., designed by W. A. Ganster and W. L. Pereira in 1939. Patients' quarters face south for maximum sunlight, and beds may be wheeled out through wide doors



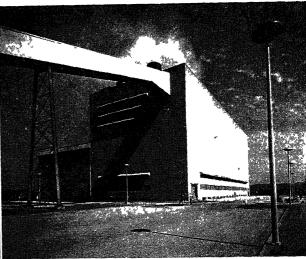
Above: "Falling Water" house designed by Frank Lloyd Wright and built at Bear Run, Pa., in 1939. Form and materials were integrated with the setting of rocky ledges above a running stream Below: Corridorless house built for Walter Gropius at Lincoln, Mass. Walter Gropius and Marcel Breuer, associated architects



Above: Main reception building at the Great Lakes naval training station, Great Lakes, Ill., completed in 1942. Skidmore, Owings and Merrill, architects

Below: Watts Bar steam plant, a unit of the TVA, built near Dayton, Tenn., in 1942. Note functional design of street lights and conveyor





windows appeared to be necessary to satisfy the workers. The Kaiser Portland shipyards provided a child service centre, Wolff and Phillipps, architects. Large hospitals were built throughout the country to serve the war needs, as for example, the 3,000-bed Halloran General hospital at Staten Island, N.Y.

Projects for the reconstruction or rehabilitation of urban areas were exhibited and developed in Portland, Ore., San Francisco, Calif., and St. Louis, Mo., while Boston, Mass., held a contest for a master program to promote the sound growth and prosperity of the metropolitan area.

By 1945, more projects for urban rehabilitation and housing appeared. The Metropolitan Life Insurance company proposed to finance housing construction on a large scale, aiming to become landlord to 80,000 New Yorkers. The newspapers carried advertisements offering complete prefabricated houses for sale by department stores. General Motors proposed to erect a "City of Science and Art," Saarinen and Swanson, architects.

Frank Lloyd Wright displayed a model for a building to house Solomon Guggenheim's collection of nonobjective paintings in New York city in which he used a spiral ramp as exhibition gallery.

Italy.—Italy was using architecture for the glorification of the state and the fascist ideal. In 1937, the competition for the Casa Littoria, at the Foro Mussolini in Rome, aimed to establish a national Italian architecture. This effort suggested a return to traditionalism. The railway station at Florence was strictly functional in plan, construction and concept, but permitted a monumentalism, a true continuation of the grand manner typical of Italian architecture. In 1938, there still appeared several examples of modern architecture: the buildings at the airport in Milan, Luigi Giordani, architect; a seashore colony for the fascist youth organization, A.G.I.P., and several schools and kindergartens.

In 1940, Italy was engaged in the preparation of a world's fair for 1942, in combination with ambitious plans for the beautification of Rome. Some buildings of the exposition were completed and a large amount of materials for the remainder was on hand at the beginning of the war. Traditional motifs were used, inspired by the architecture of imperial Rome and in keeping with nationalistic tendencies. (The exposition was never held.)

In 1944, Italy suffered from bomb destruction and lost some of its historic monuments such as the monastery and town of Cassino, the bridges of Florence and the Campo Santo at Pisa.

France.—In 1937, the much-renowned Paris fair was opened. The permanent buildings, the Trocadéro and the palace of modern art, were of interest. The Trocadéro was classic in its proportions and symmetry, while in the palace of modern art regard for axial balance was not stressed as much.

During that period, medical institutions of a size exceeding the U.S. prototypes were completed. (The hospitals, Louis Pasteur at Colmar with 740 beds, and Beaujon at Clichy with 1,100 beds, and the Cité Hospitalière at Lille with 4,800 beds.) Throughout all French work a native fondness for decoration was apparent.

In 1938, the influence of the doctrines of the Ecole des Beaux-Arts was still evident in the typical official architecture exemplified by the Museum of Public Works, A. and G. Perret, architects, the French legation in Belgrade, R. H. Expert, architect, and the French pavilion at the New York World's fair, by the same architect.

During the next few years normal building was static in France because of the war and the German occupation. The Allied invasion in 1944 and the bombing preceding it resulted in the destruction of towns, buildings, bridges and the transportation network. Bitter and prolonged fighting annihilated much in the mediaeval and Renaissance towns of Normandy and Brittany.

With peace, in 1945, reconstruction could be planned and the modern architect, Le Corbusier, was chosen by the ministry of reconstruction to serve on a supreme council of city planning in guiding public works. He prepared a plan for the rebuilding of the town of St. Die which was given official approval.

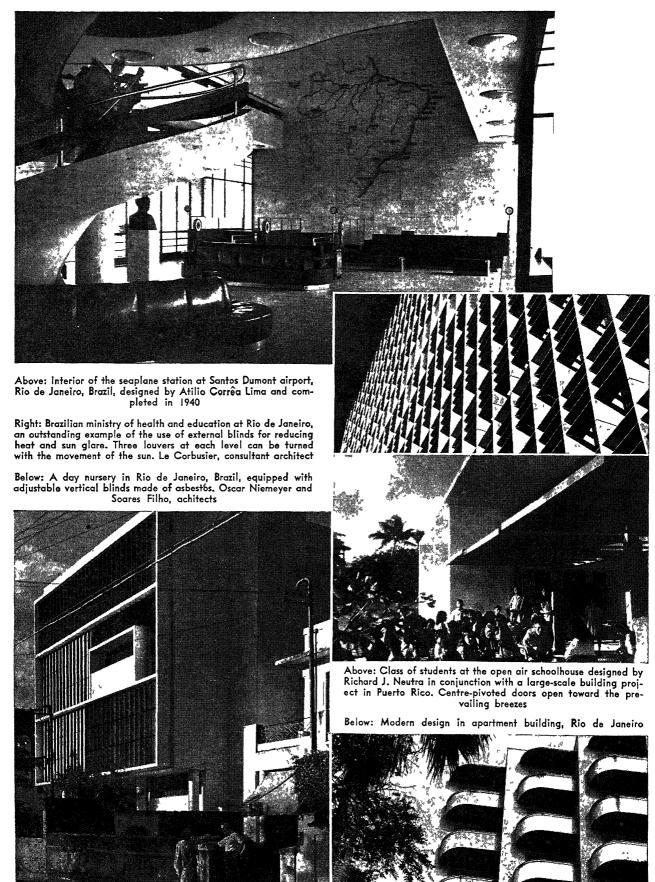
Germany.-In 1937, Germany was in the process of executing projects of a magnitude not seen for centuries on the continent. This architecture expressed the unified and aggressive spirit of the totalitarian state in which organization in the extreme made gigantic tasks possible. The individuality of the architect was denied free expression by rigid style control. The Reichsparteitaggelaende of the National Socialist party in Nuernberg consisted of tribunes for reviews, assembly fields for troops and masses of people, avenues for processions, a congress hall for 40,000 spectators with a stage for 2,400 persons, temporary housing for troops and organizations, a railroad station and a systematic network of roads. The layout stretched over a territory more than 4 mi. long and 2 mi. wide. The recreation buildings and grounds of the organization Kraft durch Freude on the island Ruegen, Clemens Klotz, architect, consisted of vacation dwellings combined with vast squares for festivals, peristyled halls for assemblies and huge swimming pools. The new airport building at the Tempelhof field in Berlin was another example of a large building, superb in system, orderly but dull in design.

In 1938, Germany continued to build in gigantic proportions. Designs for the rebuilding of Berlin were well under way. A main avenue was proposed as a new north-south axis of the city and as a site for government buildings. A circle of huge buildings neared completion before the beginning of the war as terminating feature of the axis and as a gateway to the city. In Munich, the Koenigplatz was reshaped and plans were completed for the rebuilding of the Odeonplatz and the construction of a new opera house seating 2,600 spectators.

In 1940, the Reichskanzlei in Berlin was brought to completion. It was one of the most grandiose and the last important example of national socialist architecture to be finished before the terrific onslaught of World War II. During that same period, a building for the flag regiment of the air force best illustrated the expense and careful planning which typified German military preparations.

From 1941 until 1945, the end of the war, Germany received greater and greater bombing devastation until many of its cities lay in rubble and dust, and numerous ambitious buildings erected by the nazis, as well as much of the old architecture were reduced to ruins. Precision bombing saved Cologne cathedral, but many of the fine old buildings and squares of many towns famous for their beauty, like Nuernberg and Dresden, were destroyed.

U.S.S.R.—In 1938, the soviet union reverted to traditional classicism for its new national architecture. Moscow's All Union Agricultural exposition paradoxically used porticos and columns associated with imperial Rome. The Club of Moscow showed, like most soviet architecture, an equal fondness for classic pomp. There existed a vogue for the placing of gigantic statues on the top of buildings which started with the design of the palace of the soviets and continued in many official buildings in the U.S.S.R.



as well as on the soviet pavilions in the expositions of Paris and New York.

The manufacture of houses was studied and developed by the Institute of Construction Technique, a department of the Academy of Architecture. Despite advanced prefabrication methods, traditional colour and ornate detailing was still much in evidence in small-house design. The government encouraged the development of local building materials, concentrating on brick, stone, rubble and timber, and the manufacture of artificial stones and building blocks from cement, plaster, gypsum, compressed grasses or weeds.

The organization of the profession of architecture and the building industry was carried to the extreme. The state direction of all architectural activities was vested in the Committee for Architectural Affairs under the council of ministers. The Academy of Architecture controlled the practice of the profession and had for its main purpose the improvement of standards, the study of theoretical and historical background, the advancement of planning and construction, and the training of architects and scientific workers Typical of the traditional education, the history of architecture was a major subject of study.

Smaller European Countries.—Notable contributions came to architecture from the smaller countries of Europe, where a reasonable economic stability and continuing progress in social improvements combined to provide a fertile soil for a healthy progress in architecture.

Sweden had changed from classicism to modern ideas in the early 1920s. After some experimentation with national romantic and neoclassic styles, the country turned to the modern with the Stockholm exhibition of 1930. A delicacy of form and an expression of the fine qualities of native folk art combined to achieve distinction in the work of Swedish architects, among whom Gunnar Asplund was outstanding

Swedish school buildings were distinguished for their functional interpretation of the educational and spiritual needs of children. Swedish housing was outstanding for the demonstration of the truly democratic way of living. The manufacture of prefabricated timber dwellings had grown to an extensive industry and contributed much toward the improvement of the country's housing standards. The entertainment centre of Malmoe combined the functions of theatre, opera house and concert hall in a single elaborately equipped structure. The architects (Eric Lallerstedt, Sigurd Lewerentz, David Hellden) produced the ultimate in flexibility in providing four alternate possibilities for dividing the auditorium.

In Finland, the designs of Alvar Aalto typified the functional architectural character of the new way of building. The town of Helsinki built a large, imposing stadium, Yrjoe Lindegren, architect, with a reinforced concrete tower in preparation for the Olympic games of 1940 which World War II prevented.

Switzerland was also dedicated to the modern movement in architecture. This movement was largely influenced by the work of Le Corbusier and Professor Karl Moser of the State University of Technical Science in Zurich. Among the more prominent contributions were the auditorium and convention hall in Zurich, W. M. Moser, R. Steiger and M. E. Haefeli, architects; the Cantonal hospital of Basle, E. and P. Vischer, H. Bauer, B. L. Duerig, architects; and several schools. Many modern apartments were built and residential design in general was distinguished by its native charm.

Other Countries.—In Palestine, South Africa and Australia, examples could be found which in their similarity

to the modern buildings of Europe showed the international acceptance of the modern movement.

Brazil developed a modern architecture peculiarly suited to its local climate and customs. The buildings showed in their designs the influence of Le Corbusier combined with a native character given them by their Brazilian architects. Among outstanding examples were the Instituto de Resseguros at Rio de Janeiro, Marcelo, Milton and Mauricio Roberto, architects, several office buildings with façades consisting of grids of concrete fins for the shading of windows, and the work of the architect, Oscar Niemeyer. (See also Building and Construction Industry.)

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Archives, National

At the beginning of the decade 1937–46, the United States National Archives was an infant government agency. Established in June 1934, it had only just begun to transfer to its specially constructed modern building on Constitution avenue between Seventh and Ninth streets in Washington, the permanently valuable noncurrent federal records it had been created to preserve and service. In the next ten years, however, an increasing stream of such records flowed in until by the end of 1946 the archivist of the U.S. had in his custody about 750,000 cubic feet of government records.

These records came from congress, the White House, every executive department, scores of other agencies, and several federal courts. They ranged in date from the Revolutionary War through World War II. Among them were hundreds of millions of handwritten or typewritten documents; about 450,000 maps and charts, of which half were manuscript or annotated; more than 200,000 sound recordings, including recordings of such historic events as the Normandy invasion and of speeches by prominent people; more that 1,300,000 photographs, including such early ones as Mathew Brady's famous Civil War pictures; and some 60,000 reels of motion-picture film, including axis films captured during World War II.

Only a fraction of the records created by federal agencies were deemed worthy of permanent preservation, and one of the jobs of the National Archives was to facilitate the destruction of those of no lasting value. Procedures for disposal were greatly simplified during the decade, and the National Archives undertook a records administration program, which encouraged government agencies to modernize their filing methods, dispose of worthless material promptly, and transfer valuable records to the National Archives as soon as they were no longer needed for day-to-day transactions. This program resulted in better control over current records, in substantial economies of time, equipment and space, and in more valuable records being transferred to the National Archives.

Most of the important older records of the government

were, by the end of 1946, in the National Archives. Many federal agencies, including the war and navy departments, transferred practically all their records up to World War II, and the records of a number of World War II agencies, such as the Office of Censorship, the Office of War Information, the Foreign Broadcast Intelligence service, and the War Relocation authority, had already been received. This wealth of material recorded the experience of the U.S. in war and peace from its earliest days of independence. Such symbols of the long struggle for freedom as the Treaty of Paris in 1783, in which Great Britain recognized the independence of the American colonies, the Bill of Rights, the Emancipation Proclamation, and the German and Japanese surrender documents were among the records in the National Archives. Most permanently valuable federal records, however, were preserved for the information they contained rather than for their symbolic or patriotic character. The major contribution of the National Archives was to make that information available. This it accomplished during the decade through exhibits, a reference service, and description of the records in guides, such as Your Government's Records in the National Archives, in catalogues of exhibits, such as The National Archives of the United States; Catalog of Exhibit and President Roosevelt and International Cooperation for War and Peace, and in documentary publications, such as Germany Surrenders Unconditionally and The End of the War in the Pacific, containing facsimiles of World War II surrender documents.

During the decade, requests for services on records in the National Archives jumped from about 20,000 to as high as 320,000 a year. These requests were filled by supplying information by letter, telephone or personal interview, by preparing studies, by lending records to government agencies, by furnishing photographic copies of documents at cost, and by making records available for use in the searchrooms, open every day except Sunday.

Uses made of federal records were as varied as the records themselves. Scholars, writers, and the public in ever-increasing numbers used records for political, economic, and social studies, for biography, for genealogical research, or to obtain information for the protection of some legal right, such as the right to a pension. Changing events greatly coloured the details of information sought, but the kinds of uses remained much the same. The government usually sought precedents or information for the protection of its legal rights or those of others.

During World War II the government drew upon its own experience in World War I, the records of which were in the National Archives. Information thus obtained saved precious time and helped to avoid mistakes on the administrative front. To guide busy officials to pertinent materials, the National Archives prepared many special studies and published a 666-page Handbook of Federal World War Agencies and Their Records, 1917-21. To assist on the operational side of the war, the National Archives supplied pictures of roads, railway terminals and power plants in Europe and Asia, charts of many a Pacific atoll, and reports of consular and diplomatic representatives on the natural, industrial, and human resources of axis countries. Information about archives in Europe and Asia was furnished so that they might be spared unnecessary bombing and later might be protected and utilized by the occupation authorities. Never before in the history of warfare had soldiers invaded countries armed with such information about the historical and administrative archives of the enemy. With the end of hostilities, the interest in records in the National Archives shifted to those pertaining to reconversion, the rehabilitation of veterans, the disposal of surplus property, and the punishment of war criminals.

In 1936 the National Archives began publication of the daily Federal Register, containing government regulations having public effect. During the war, the Federal Register grew in size and importance as an aid to administration, both governmental and industrial. An administrative procedure act required the publication in the Federal Register of descriptions of the organizations and procedures of all federal agencies and many other documents not previously required to be so published.

The decade saw the establishment, in 1939, of the Franklin D. Roosevelt library at Hyde Park, N.Y., as a government agency under the administration of the archivist of the U.S. The library, designed to house Roosevelt's papers and collections and related materials, opened some of its holdings to searchers in 1946, and thus began to realize its importance as a research centre.

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Arctic Exploration

See Exploration, Polar.

Areas and Populations

The accompanying table presents the area, population and density of population of the various nations of the world, using the latest figures available at the end of the decade 1937–46. Under the postwar conditions of 1946, it was difficult in some instances to secure data which were entirely satisfactory. The figures relate to different dates in different countries. (For population figures at intervals during 1936–47, see specific country.)

	Area	Population P	opulation
Continent and State	(in sq. mi.)	(in thousands)	per sq. mi.
World total	52,177,643	2,231,716	42.7
Africa	11,524,825	163,163	14.1
Belgian colony and mandate	925,094	13,767	14.8
British colonies, dependencies, and mandates	2,952,301	52,994	17.9
Egypt	383,000	17,380	45.3
Erifrea, Libya, Somaliland	1,039,429	2,745	2.6
Ethiopia	305,731	9,450	30.9
French colonies and mandates	4,150,770	42,706	10.2
Liberia	43,000	2,500	58.1
South-West Africa	801,297	9,419	11.7
Spanish colonies and dependencies.	323,000	321	1.0
Tangier	128,421 232	890	6.9
Union of South Africa	472,550	102 10,889	441.0
Asia (exclusive of U.S.S.R.)	10,517,845	1,196,720	23.0 113.7
Aegean Islands	1,035	1,190,720	117.4
Afghanistan	250,000	10,000	40.0
Arabia	609,841	5,250	40.Q 8.6
Bhutan	18.000	250	13.9
British colonies, dependencies, and mandates	284,317	16,183	56.9
Burma	261,810	16,824	64.3
China and dependencies (incl. Formosa)	3,876,956	475,382	122.6
French India	197	323	1.641.1
India	1,581,410	388,998	246.0
Indo-China	286,119	23,750	83.0
Iran	634,413	15,000	23.6
Iraq	116,600	5,000	42.9
Japan (proper)	1 <i>47,57</i> 3	77,998	528.5
Korea	85,225	24,326	285.3
Kuwait	1,930	50	25.9
Lebanon	3,470	1,022	294.6
Nepal	_54,000	_5,600	103.7
Netherlands Indies	735,000	70,476	95.8
Oman and Muscat (Masqat)	82,000	500	6.1
Outer Mongolia	622,744	850	1.3
Portuguese colonies	115,600	16,000	138.4
Portuguese colonies	8,873 198,247	1,420	160.0
Syria	72,560	15,717	80.0
Tannu Tuva	64.000	2,884 65	39.7
Trans-Jordan	34,740	371	1.0 44.4*
Turkey (incl. Turkey in Europe).	296,185	18.860	63.7
Yemen	75,000	3,500	46.7
*Average for settled area only.	. 5,550	0,000	40.7

	Area	Population	Populatio
Continent and State	(in sq. mi.)	(in thousands)	
Europe (exclusive off U.S.S.R.)	2,648,626	394,308	148.1
Albania	11,100 174	1,128 6	101.6
Austria (1937 area)	32,639	6,695	34.5 205.1
Belgium	32,639 11,774	8.396	713.0
Bulgaria	39,814 124	6,370	159.9
Czechosłóvakia (Bohemia, Moravia and Si-	124	287	2,314.5
lesia Slovakia 1945)	49,380 730	13,936	282.2
Danzig	730	403	552.1
Estonia (absorbed by the U.S.S.R. in 1940)	17,113 18,357	3,819 1,122	223.1 61.1
Finland	134,000	3,850	28.7
France	134,000 212,737	41,980	197.4
Finland	182,471 143,243	69,622 63.200	381.5 441.2
Great Britain and Northern Ireland	93,991	63,200 47,735	507.8
Greece	50,269	7,336	145.9
Hungary (1945 area)	35,911 39,688	10,81 <i>7</i> 120	301.2 3.0
Ireland (Eire).	26,602	2,938	110.4
Ireland (Eire)	119,764	45.681	381.4
Latvia (absorbed by the U.S.S.R. in 1940). Liechtenstein	25,016 65	1,995 11	79.7 169.2
Lithuania (absorbed by the U.S.S.R. in 1940)	22,959	2,879	125.4
Luxembourg	999	301	301.3
Luxembourg	0.6 12,742	24 9,076	38,452.6 712.2
Norway (incl. Spitzbergen)	143,379	2,922	20.3
Norway (incl. Spitzbergen) Poland (1939)	150,820	35,100	232.7
Portugal (incl. Azores and Madeira Isls.)	35,413 74,000	7,722 16,000	218.1 216.2
Rumania (1941)	38	14	368.4
Spain (incl. Balearic and Canary Isls.).	194,945	25,878	132.7
Sweden	173,341 15,940	6,597 4,266	38.0 267.6
Vatican City.	0.5	4,200	1,500.0
Sweden	95,558	15,703	164.3
U.S.S.R	8,173,666	170,467	20.9
Oceania	3,305,704 183,562	11,287 1,002	3.4 5.4
Australia	2,974,581	7,342	2.4
U.S.S.R. Oceania Australian colonies and mandate. Australia British colonies, mandates, and dependencies	20,050	419	20.8
Caroline, Marshall and Mariana Islanas Itor-	830	120	147.2
mer Japanese mandates). French colonies and mandates. New Hebrides (Anglo-French condominium). New Zealand (incl. New Zealand depend-	9,199	98	10.6
New Hebrides (Anglo-French condominium).	5,700	43	7.5
New Zealand (incl. New Zealand depend-	103,929	1,656	15.9
encies)	6,720	537	79.9
Western Samoa (New Zealand mandate) .	1,133	68	60.0
North America	9,155,310	198,542	21.6
British colonies	21,259 3,462,103	2,458 11,507	11 <i>5.</i> 6 3.3
Canada	23,000	725	31.5
Cuba	44,217	4,779	108.1
Curação (Netherlands)	383 19,129	125 1,999	326.3 104.6
El Salvador	13,176	1,896	143.9
French colonies	1,169	574	491.0
Greenland	839,782 42,042	18 3, 547	0.02 84.4
Haiti	10,695	3.500	327.2
Honduras	59,145	1,201	20.3
Costa Rica. Cuba. Curaçao (Netherlands). Dominican Republic. El Salvador French colonies. Greenland Guatemala Haiti Honduras Mexico. Newfoundland and Labrador Nicaraqua.	767,168 153,560	21,673 310	28.2 2.0
Nicaragua	57,143	1,049	18.3
Nicaragua	28,575	632 140,387	22.1
United States	3,022,387 590,377	2,162	46.4 3.6
South America	6,851,667	97,229	12.7
Argenting	1,079,965	14,131	13.0
Bolivia	416,040	3,534	8.4
Brazil	3,291,416 85,118	45,300 367	13.7 4.3
Chile	286,323	5,237	18.3
Colombia	438,825	10,702	24.3
Ecuador	103,415 34,740	3,171 37	30.6 1.1
Paraguay	154,165	1.108	7.1
Peru	482,133	<i>7,</i> 396	15.3
Surinam (Netherlands Guiana) Uruguay	55,212 72,172	192 2,203	3.5 30.3
Venezuela	352,143	3,851	10.9

†1945 figures used in computing totals.

Argentina

Argentina, second largest nation of South America, extends approximately 2,070 mi. from north to south, with a maximum width of about 860 mi. The area (excluding the Falkland or Malvinas Islands, to which Argentina laid claim) is 1,079,965 sq.mi. Pop. (est. of Dec. 31, 1944), 14,130,871; earlier official estimates of the national population were: 1940, 13,132,279; 1941, 13,320,641; 1943, 13,909,950. The population was estimated to be 97% of European (mostly Spanish and Italian) descent. The total of foreign-born population in 1940 was 2,355,900. An official estimate in 1938 indicated the percentage of urban population to be 74% as against 33% shown by the census

of 1869. Population density for the entire country was estimated Dec. 31, 1943, as 12.96 per sq.mi. The capital is Buenos Aires (pop., 1945 est., 2,608,333; by 1941 municipal census, 2,408,900), the continent's largest city and Argentina's most important port. Other important cities (with official population estimates) are Rosario (521,210), Avellaneda (399,021), Córdoba (339,375), La Plata (256,-378), Tucumán (169,566), Santa Fé (149,926), Bahía Blanca (121,055), Mendoza (100,429) Lomas de Zamora (100,000), Vicente López (95,770), Mar del Plata (94,-500), San Juan (80,000), Paraná (76,600). Under the constitution of 1853 (the oldest in any Latin American state) Argentina included 14 provinces and 9 territories; a decree of Sept. 24, 1943, abolished the territory of Los Andes and divided its area among the three adjoining provinces of Catamarca, Jujuy and Salta. The municipality of Buenos Aires was withdrawn in 1880 from the province of the same name and nationalized as a federal district. The government of Argentina was constitutionally patterned after that of the United States to include a president chosen by a popularly elected electoral college for a six-year term, a bicameral congress composed of a senate of 30 and a chamber of deputies of 158 members, and a judiciary headed by a supreme court. Presidents during the decade 1937–46 were as follows: Gen. Agustín P. Justo, 1932-Feb. 20, 1938; Dr. Roberto M. Ortiz, Feb. 20, 1938-July 3, 1940 (Ortiz surrendered the executive power on that date but did not actually resign the presidency until June 27, 1942); Ramón S. Castillo, July 3, 1940–June 4, 1943; Gen. Arturo Rawson, June 4-6, 1943; Gen. Pedro Pablo Ramírez, June 6, 1943-Feb. 24, 1944; Gen. Edelmiro Farrell, Feb. 24, 1944-June 4, 1946; Gen. Juan Domingo Perón, after June 4, 1946.

The Justo and Ortiz Administrations.-The presidential elections scheduled for Sept. 1937 and the preliminary political activities consequent upon them precluded adoption of much legislation of far-reaching importance when the congress convened May 13. Pres. Justo's general legislative program during his last year in office was to carry forward his policies of previous years. Under them, Argentina had reversed a semi-isolationist policy of some years standing and, under the energetic leadership of Foreign Minister Carlos Saavedra Lamas, had assumed a prominent and aggressive role in international affairs. The domestic policy had in general been a conservative one favouring the powerful landed interests that had been instrumental in electing Justo in 1932 and in the revolution of 1930; some guarded measures of social reform had been introduced, however. In the early weeks of the congressional session of 1937 legislation for land settlement colonization to be financed by the government and for minimum wages, maximum hours and regulation of working conditions was introduced.

On June 23, Dr. Roberto M. Ortiz, minister of finance, and Dr. Ramón S. Castillo, minister of government, resigned their posts to become, respectively, presidential and vice-presidential candidates of the "Concordancia," or government coalition, in the September elections. They represented different wings of the alliance, Ortiz the moderate and Castillo the extreme conservative, and had been chosen to "balance the ticket." The Concordancia was opposed in the campaign by the Radical party, which had been in power from 1916 to 1930, and whose candidate was Dr. Marcelo T. de Alvear, president of the republic from 1922 to 1928. In the September elections, Ortiz won by an electoral vote of 248 to 128 and a popular vote of



Requiem mass at the Buenos Aires cathedral June 12, 1943, for 82 persons killed in Gen. Pedro Ramiřez' coup d'état eight days earlier

1,093,928 to 815,053. The election presumably assured a continuation of the main policies of the Justo regime.

The assassination in April of Josef Riedel, Argentine leader of German nazi activities, in Buenos Aires, aroused strong feelings and caused representations to be made by the German government. Argentina began negotiations with the U.S. during 1937 for a reciprocal trade agreement and during the same year consummated several important commercial treaties. Trade agreements were made with Czechoslovakia, Germany, Italy and the Netherlands. A temporary executive agreement with Peru terminated a serious trade dispute of several years' standing and pointed the way to a definitive treaty. In Feb. 1937 the government signed a tripartite agreement with Bolivia and Para-

guay for the establishment of commissions to develop fur ther trade relations among the three countries. The sen, ate in June ratified eight treaties drafted by the special Inter-American Conference for the Maintenance of Peace which had met at Buenos Aires in Dec. 1936 under the presidency of Saavedra Lamas.

Ortiz was formally inaugurated president on Feb. 20, 1938, for a six-year term. He began a relatively conservative policy characterized by his inaugural declaration against non-American entanglements and in favour of democracy; he also urged strengthening of the national defenses and a continued balanced budget. The congressional elections on March 5, 1938, were generally condemned by the Argentine press as fraudulent, and supplementary elections were held in some districts. Pres. Ortiz thus began a policy of encouraging honest elections, which at times was interpreted as operating to the detriment of his own party. The administration gained a congressional majority in the 1938 elections, so that the government was able to put through its general program without the difficulties experienced in the previous session of the congress.

The new foreign minister, José María Cantilo, conducted a vigorous international policy. He made "good will" tours early in the year to neighbouring Chile, Brazil and Uruguay. The foreign office in April 1938 negotiated an adjustment of a minor boundary dispute with Chile, involving certain Beagle channel islands in the far south of the continent, and provided for submission of the controversy to the arbitration of the attorney general of the U.S. Trade treaties were made during the course of the year with Chile, France and Poland, as well as a barter agreement with Italy, by terms of which Argentine wool and hides were to be traded for Italian-built oil tankers. Public opinion in Argentina expressed itself strongly against nazi Germany, especially after the Munich conference in the fall of 1938, and some efforts to settle Jewish agricultural refugees in Argentina were reported. Foreign Minister Cantilo, however, followed a very restrained policy toward Germany, and at the eighth Pan American conference at Lima, Peru, in December the Argentine delegation led the opposition to a strong stand against totalitarianism. Cantilo was present briefly at the conference but was not a member of the Argentine delegation. Argentina insisted upon mild expressions of Pan American solidarity and was chiefly responsible for a considerable dilution of the resolutions adopted at Lima.

During 1937 Argentina had experienced her greatest prosperity after 1929, as evidenced by the heaviest governmental revenues on record, but poor crop conditions in 1938 resulted in a serious decline in production, a falling off of exports and the tightening of credit. The Argentine peso declined in terms of foreign moneys. Because of the adverse economic conditions, some reductions were made in the 1938 budget, and that budget eventually (in November) was continued for 1939. The government placed considerable stress on public works and on June 28 created a national council of public works. This agency was entrusted with the co-ordination of activities in the 100,-000,000-peso annual program and was charged with regulating construction so that it would be increased during periods of depression and diminished during times of prosperity. Bids and purchases of equipment for the national railways totalling 11,300,000 pesos were made during 1938. Agrarian loans increased to 337,315,227 pesos, the highest sum after 1915. In an effort to aid agricultural prices, restrictions on sugar production were enacted by law, and the government was authorized to set minimum prices on wheat and other commodities. The government spent or

committed itself for the purchase of armaments to the extent of about 90,000,000 pesos during 1938.

Developments in 1939 revolved primarily around the growing threat of war and its later actual outbreak. Publication of documents early in April purporting to reveal sensational German designs on sparsely populated Argentine Patagonia led to a government investigation of the nazi party in Argentina and of other German-influenced groups. The approximately 60,000 Germans and 110,000 persons of German descent in Argentina were in large measure well regimented by German diplomatic representatives and nazi officials and were a factor of concern to the Argentine government. The government on May 15, 1939, issued a decree outlawing all organizations with foreign political leadership or financial support. Italian fascist organizations and the Spanish Falangists, as well as the nazis, were affected. The less effective organization of the Italians (estimated at 780,000 of Italian birth and 2,200,000 of Italian descent) made them of less concern to the government.

The outbreak of World War II on Sept. 1, 1939, brought a prompt declaration of neutrality from the Argentine government. The government participated in the Panama foreign ministers' conference in September-October and assumed a 10le of prominence in the expulsion of the U.S.S.R. from the League of Nations in December. The running engagement of the German pocket-battleship "Graf Spee" off the coast of Uruguay early in December and the subsequent flight of its crew to Argentine waters after they had scuttled the ship following its expulsion from Montevideo harbour, involved Argentina in diplomatic interchanges with Germany, which protested the internment of the sailors. Many of the officers and men later escaped singly or in small groups from Argentine internment, leading in some quarters to charges of laxity in segregating them.

The outstanding feature of the year politically was Pres. Ortiz' campaign for honest elections, which brought him into sharp conflict with the conservative factions that had elected him. Federal intervention (a constitutionally established prerogative of the president) in San Juan and Santiago del Estero provinces early in the year was followed in December by Ortiz' demand that the governor of Catamarca annul fraudulent provincial elections which the Conservative party had won. The situation became politically critical early in 1940 when Vice President Castillo came openly to the support of the governor, and three Conservative members of Ortiz' cabinet resigned in protest.

Foreign trade problems proved of major concern in 1939. As a result of the unfavourable trade balance in 1938, the government adopted a rigid import control policy in Feb. 1939, designed especially to limit imports from countries selling more in Argentina than they bought; the U.S. was especially affected by the policy. Despite official espousal of a multilateral trade system as Argentina's ultimate goal, the government continued its previous policy of bilateral trade treaties; such treaties were made with Denmark and Spain, and most-favourednation agreements with France and Norway. Formal negotiations for a reciprocal trade agreement were reopened with the U.S. in Nov. 1939 to end, if possible, the long period of chaotic trade relations between the two countries. When the war in Europe threatened to cut off Argentina's normal sources of supply, the drastic exchange and import restrictions against U.S. products (the quota had been cut 40% in February) were materially relaxed. Nevertheless, government emphasis was placed on purchases from Great Britain and France. The national public works program was continued throughout 1939, with an authorized expenditure of 200,000,000 pesos in addition to the extensive highway-construction program financed by the imposition of new and the increase of old automotive fuel taxes. The government in 1939 completed the purchase of the Córdoba Central and the Transandine railways, after several years of negotiations, for respective prices of £10,000,000 and £750,000; the latter railway had been closed by landslides in 1934.

Pres. Ortiz formally intervened in Catamarca province on Feb. 19, 1940, to set aside the fraudulent elections earlier held in that province and a few days later took similar action in Buenos Aires province. Interventions in both cases were directed against Conservative provincial administrations, with the result that a political crisis was precipitated; Ortiz was largely deserted by the Conservatives who had elected him and, in effect, went over to the Radical party for support. Congressional elections in March 1940 gave the Radicals control of the lower house of the congress for the first time after the revolution of 1930.

Return to Conservatism.-Pres. Ortiz' serious illness (diabetes and threatened blindness) compelled him to relinquish executive power on July 3, 1940, to Vice-President Castillo and thereby prevented the realization of the full effect of the provincial interventions and the swing of the political pendulum. Castillo was an old-line Conservative entirely out of sympathy with Ortiz' internal policies and reforms. A senate investigating committee precipitated a political scandal in Aug. 1940 by involving the minister of war in a huge land fraud. Ortiz, though bedridden, temporarily resumed office and, declaring the charges to be a personal reflection upon him, tendered his resignation to the congress. The latter body on Aug. 24 rejected it by a vote of 170 to 1. Ortiz then again turned the executive office over to Castillo. A new cabinet composed entirely of moderate Conservatives was organized on

Questions of foreign affairs and war-reflected problems

"The Mysterious Stranger." Argentina's presence among the United Nations as viewed by Daniel Bishop of the St. Louis Star-Times



continued to plague Argentina during 1940. Relations with the U.S. revolved around two major sets of problems-economic and trade difficulties, and hemisphere defense and the general relationship of the hemisphere to the war. The economic difficulties arose from the competitive products of the two countries, especially beef and wheat, and the long-continued unfavourable balance of trade with the U.S.; an additional chronic irritant was U.S. discrimination against importation of Argentine meats because of the presence in Argentina (allegedly magnified as an argument) of hoof and mouth disease. Reciprocal trade negotiations carried on during 1939 were abandoned in Jan. 1940, especially because of strong opposition from cattle-producing sections of the U.S. The foreign exchange problem became increasingly acute when Argentina's purchases from the U.S. doubled during the early months of the year and, in July, Argentina began restricting imports from the U.S. to a point that had virtually reached an embargo by September. U.S. governmental agencies in December, however, advanced credits of \$110,000,000 to Argentina, with \$50,000,000 specifically allocated to currency stabilization.

Problems of hemisphere solidarity as they involved Argentina came into focus at the second foreign ministers' conference at Havana, Cuba, in July 1940. The Argentine delegation, although refusing to assent to some of the more extreme proposals, generally worked in harmony with those from the other American republics. Inasmuch as the main question before the conference was that of the provisional administration of the European colonies in the western hemisphere in the event that nazi Germany should attempt to assume control, Argentina felt an especial concern because of her long-standing though dormant controversy with Great Britain over title to the Falkland Islands. Late in 1940 Argentina made strong protests against a proposed Uruguayan concession of naval base rights to the U.S., although in general Argentina indicated a willingness to join in hemisphere defense plans. The government in July 1940 approved defense appropriations in excess of 1,100,000,000 pesos. The vulnerability of the coast line of more than 1,800 mi. indicated the need for strong emphasis on naval and air defense. The government hence began improvement of naval and aviation bases along the Patagonian coast. High Argentine army officers visited the U.S. in Nov. 1940 on an official inspection trip as part of an inter-American defense program.

The trickle of escapes involving interned crew members of the "Graf Spee" tended to turn Argentine public opinion more and more against the axis in 1940, an effect intensified by the propaganda activities of some of the "Graf Spee" officers. Revelation of the propaganda activities of the nazi-subsidized newspaper El Pampero and of numerous pro-German groups within the country further antagonized public feelings. Much of the activity of German groups centred, especially in the latter part of 1940, in the northeastern territory of Misiones. The government encountered great difficulty in efforts to suppress fifth-column activity there and elsewhere in Argentina.

Sympathy toward Great Britain, on the other hand, continued strong. That country had long been Argentina's best customer and supplier. British purchases of Argentine meats in 1940 reached huge proportions, but full immediate economic return to Argentina was precluded by the British policy of payment in blocked sterling, a practice which brought about an acute shortage of foreign exchange with which Argentina might meet its obligations

elsewhere. An Argentine cattlemen's committee formally offered in Oct. 1940 to restock all visiting British warships with fresh meat free of charge and in December a similar group donated 6,000 head of cattle to the British government. British contracts for foodstuffs, especially meats, for the following 12 months were reported on Oct. 11, 1940, to total between £25,000,000 and £40,000,000. In addition to the continuing close commercial relations with Great Britain, Argentina in 1940 negotiated commercial treaties with Brazil, Colombia and Japan.

Domestic political and economic problems continued troublesome in 1941. The continued incapacity of Pres. Ortiz resulted in political confusion. Ortiz, elected on a Conservative ticket, had veered into a de facto entente with the Radical party, which controlled a majority of the chamber of deputies, but Acting Pres. Castillo proved to be increasingly an ultra-conservative. Tension increased as the year progressed and lessened only with the adjournment of the congress in Oct. 1941. The Radical party, especially because of Ortiz' insistence on enforcement of the "Sáenz Peña law" of 1912 providing for secret voting, viewed the future optimistically and at the beginning of 1941 demanded the annulment of allegedly fraudulent provincial elections in Mendoza province on Dec. 15, 1940, and in Santa Fé province on Jan. 5, 1941. The party adopted an obstructionist policy in the congress and refused to pass essential legislation, hoping in this way to force free-election pledges from Castillo. Only a few bills had been acted upon by May 1941, the budget for the year had not been approved, nor had a recently negotiated \$100,000,000 Export-Import bank loan by the U.S. to Argentina been ratified. When Castillo by executive decree extended the 1940 budget to 1941 and threatened to govern entirely by decree if necessary, the Radical deputies on May 6 ended their legislative boycott. Two prominent cabinet members had resigned the preceding January, reportedly in protest against the acting president's election policy; they were Foreign Minister Julio A. Roca, who had been vice-president under Justo from 1932 to 1938 and was the Argentine negotiator of the famous Roca-Runciman commercial agreement with Great Britain, and Finance Minister Federico Pinedo.

The frequently-negotiated trade agreement with the U.S. was finally signed on Oct. 14, 1941. It provided for reduction of tariff duties by roughly 50% on 84 items which had accounted for 93% of Argentine exports to the U.S. in 1938 and 1939; Argentina in turn reduced her tariff from 25% to 50% on a variety of imports from the U.S. The most important Argentine commodities affected were canned meats, wool, hides, linseed and casein. Although the commercial status of Argentine fresh meat, importation of which into the U.S. had been prohibited after 1927 on grounds that Argentina regarded as insubstantial, was unchanged by the agreement, the general effect of the new arrangement was to remove a major obstacle to hemisphere solidarity. As a result of a Rio de la Plata regional conference in Jan. 1941, Argentina signed a treaty with Brazil on Nov. 21 providing for reciprocal progressive reduction of duties on noncompetitive commodities, tariff exemption of new industrial products, and improvement of communications facilities between the two countries. Other trade treaties were made with Bolivia and Cuba, and negotiations were begun with Chile, Paraguay and Uruguay.

Relations with Chile were somewhat disturbed, however, by the continuance of conflicting territorial claims in the Antarctic; friendly negotiations on the subject failed to produce tangible results. Another question affecting rela-

tions with Chile during 1941 was that of the possible abrogation of a prohibition written into a treaty of 1881 on fortification of the Strait of Magellan; this question was an outgrowth of the new armament and fortification policy of Argentina.

More serious problems of foreign relations grew out of the war. Nazi and fascist propaganda and other activity in Argentina was intensified during 1941. The congress in June aired charges of totalitarian propaganda in the army and of subversive activities in other quarters. Minister of Interior Miguel Culaciatti on June 18 officially admitted, on formal interpellation by the congress, that nazi activities in many directions had become intense, but he belittled their importance. Nevertheless, the chamber of deputies created a committee, headed by Deputy Raúl Damonte Taborda, to investigate "activities contrary to the institutions and sovereignty of the Argentine Republic." The Damonte committee (promptly labelled in the U.S. as "the Argentine Dies committee") was denied administrative and police aid, but it made a sweeping investigation and in August and September presented to the chamber a series of reports with sensational disclosures. The committee asserted that the nazi party, although formally dissolved in Argentina by presidential decree on May 15, 1939, still existed, with an organization on military lines and with the German ambassador directing its activity. German embassy expenditures, it was charged, were 36 times as great (5,983,000 pesos) in the year ending June 30, 1941, as in 1938-39. The German news agency Transocean was revealed to be purely a subsidized propaganda organization with tentacles throughout South America. The reports gave evidence of active axis agents among German schools in Argentina, of German control of 2,000,-000,000 pesos of Argentine business through nazi conquests

An estimated 500,000 Argentine citizens demonstrated in Buenos Aires on Sept. 19, 1945, demanding a return to constitutional democracy and the resignation of Juan D. Perón, then vicepresident. The banner pictures democracy breaking the people's chains in Europe, of a regular system of assessment of Germans resident in Argentina, and of the presence of at least 60,000 nazis in Buenos Aires alone. The committee also revealed the presence of strategically located German groups in Patagonia and the Misiones territory and in other South American countries.

The chamber of deputies, by a vote of 88 to 1, promptly passed a resolution declaring German Ambassador Baron Edmund von Thermann persona non grata and demanding his expulsion. Von Thermann refused voluntarily to withdraw and in September Acting Pres. Castillo formally "dissociated" his administration from the deputies' demand. Further indication of the government's unwillingness to antagonize the axis powers was seen in its cautious policy toward their shipping in Argentine harbours. Argentina refused to follow the lead of the U.S. and other American republics in seizing axis and axis-controlled ships and entered into protracted negotiations with Italy which finally resulted in the purchase of 16 Italian ships totalling 88,000 gross tons to serve as the nucleus of a state-owned merchant marine.

The political situation was suddenly obscured late in Sept. 1941 by infantry occupation of military airports and the grounding of all army planes in what was alleged to be the suppression of a plot. The arbitrariness of the action increased the division between Castillo and the Radicals; a further factor in the same direction was the president's removal, on Oct. 11, 1941, of the Buenos Aires municipal council because of alleged municipal corruption. The Radicals in the congress refused to pass important measures until Castillo pledged free provincial elections in December; the president made no such pledge, however, and the congress adjourned with the split still unresolved. The elections, as anticipated, resulted in a Conservative victory.

War Moves Closer.—Japan's attack on Pearl Harbor on Dec. 7, 1941, compelled Argentina to assume a more posi-



tive position toward the war. Castillo promptly declared that the U.S. would be treated as a nonbelligerent, and on Dec. 16 he declared a state of siege (martial law), accompanied by a suspension of constitutional guarantees, throughout Argentina. Castillo's opponents declared that the action was designed, at least in part, to facilitate his control of the domestic political situation. Newspapers were forbidden to print anything affecting Argentine neutrality or offensive to the government, the political regime, the head of the state, or officials of any belligerent nation. Demonstrations, whether pro- or anti-axis, were prohibited. The press and public opinion were strongly and openly anti-axis, however. Castillo in December recalled the Argentine ambassador from Berlin for "consultation" and on the last day of 1941 he made a formal declaration of Argentine solidarity with the U.S.

Difficulties arising out of the closer involvement in the war continued to affect Argentina in 1942. German submarines attacked two Argentine ships in the first half of the year, thereby lending force to the opposition's bitter criticism of Castillo's neutrality. The "Victoria" was damaged off the North American coast on April 17 and after a secret investigation by the Argentine foreign office it was announced that the damage was accidental and was caused by "an internal explosion of undetermined origin," but on June 17 the foreign office reported receipt of a nazi apology for the attack upon the vessel. The "Rio Tercero" was sunk on June 22 only 120 miles off New York city; the Argentine government on June 26 made a vigorous protest to Germany, calling for the payment of damages, a salute to the Argentine flag, and a guarantee that Aigentine neutral rights would thenceforth be respected. But upon delivery of the German reply, revealed July 6, the Argentine government accepted the excuse of mistaken identity, agreed to waive the salute to the flag, and undertook to provide Germany with information on Argentine ship sailings so as to prevent further incidents. When Germany announced a blockade of eastern North America, Argentine ships were rerouted to gulf and Pacific coast ports. These developments brought vigorous criticism in the chamber of deputies, where the party division was close, and before adjourning on Sept. 30, the chamber by a narrow margin voted a resolution favouring a severance of diplomatic relations with axis powers. This action was in line with the position taken at the third foreign ministers' conference at Rio de Janeiro in Jan. 1942, but in view of the Conservative majority in the senate it amounted only to a gesture.

The Castillo administration in the meantime took various steps toward closer co-operation with the other American republics and toward improvement of its own national security. The government in June issued various decrees to enforce economic and financial control measures recommended by the Rio conference. When Brazil declared war on Germany on Aug. 22, 1942, Argentina proclaimed the former a nonbelligerent and declared it would grant all facilities necessary for the defense of Brazilian interests. Closer relations with other Latin American countries were encouraged throughout 1942. Argentine action against axis agents and in support of hemisphere defense was accelerated in Oct. 1942 by the important Boston speech of Undersecretary of State Sumner Welles in which he asserted that Argentine and Chile, the only two American republics which had not yet severed relations with the axis powers, were centres of intrigue and espionage against the United Nations. The

Argentine foreign office protested on the ground that that country should first have been shown the evidence supporting his charges; when such evidence was presented the government undertook an immediate investigation. As a result, 38 persons were arrested on charges of espionage, and 6 of them were remanded for jail terms. When the Anglo-U.S. invasion of North Africa occurred in November, Foreign Minister Enrique Ruiz Guiñazú cabled a statement of Argentine "solidarity" with the U.S. to Secretary of State Cordell Hull. Castillo, on his return to Buenos Aires from a trip to the Bolivian border in Sept. 1942, announced "enormous popular enthusiasm" for his policy of neutrality. Ex-Pres. Justo emerged at about the same time as a potential opponent of the Castillo regime, ostensibly because of differing views on foreign policy. He made a dramatic flight to Brazil to place himself at that country's service in its war against Germany. Castillo on Oct. 5 intervened in Corrientes province and, on grounds of maladministration, removed the pro-Justo government in office there. Minister of War Juan N. Tonazzi, reputedly sympathetic with Justo, soon afterward resigned his post, thereby apparently confirming persistent rumours of an imminent cabinet shakeup.

In domestic politics, the confused situation was somewhat clarified by the ultimate resignation of Pres. Ortiz on June 27, 1942. He had by that time become totally blind; his death followed about three weeks later. Conservative party control, and with it support for Castillo's policies, was restored in the chamber of deputies by congressional elections on March 1, although the Radicals maintained a slim margin of potential influence by being able to combine with Socialist deputies; the senate remained strongly Conservative. The increasingly serious impact of the war on Argentine economy in 1942 forced the adoption of measures designed to conserve domestic supplies of essential materials, including the rationing of automobiles, rubber goods, newsprint and fuels. Continued inflation also was of concern to the government. The year 1942 saw some improvement in transportation facilities, especially in the large expansion of air services provided by Pan American Airways and in the continuation of an Argentine rail link being pushed toward the Bolivian oil fields centring around Santa Cruz.

Argentina still refused to break diplomatic relations with the axis powers during 1943. This policy was maintained despite powerful pressure from the United Nations and in spite of the fact that a Chilean severance of relations on Jan. 20,1943, left Argentina as the only American nation not having so acted. Rumours in May and June indicated that a break might be impending, but control of foreign affairs, both before and after the revolution of June 3-4 (see below) remained in the hands of persons determined to pursue an isolationist policy. The investigation of espionage activities in Argentina, mentioned above, tended to centre around the German naval and air attaché, Capt. Dietrich Niebuhr. When he claimed diplomatic immunity the Argentine government on Jan. 18, 1943, requested his recall. A sharp exchange of notes between Great Britain and Argentina took place at about the same time because of British criticism of Argentine isolation. U.S. Vice-President Henry A. Wallace pointedly ignored Argentina on a semi-official "good will" trip through South America in the early part of 1943. Argentina was also snubbed in failing to be invited to the United Nations food conference held in the U.S. in May

The state of siege which had been proclaimed soon after the attack on Pearl Harbor had been indefinitely

extended on Dec. 14, 1942, and under it the government retained and exercised emergency powers in 1943. The presidential election scheduled for 1944 focused attention increasingly upon domestic politics even to the partial exclusion of the war. Ex-Pres. Justo had emerged by the end of 1942 as the chief opponent of administration policies, but his sudden death on Jan. 10, 1943, removed him as a political factor. Pres. Castillo in late May and early June came out openly in favour of Robustiano Patrón Costas, wealthy and conservative political leader, as his successor a year later. The plans and policies of the administration were apparently aimed particularly at gaining the support of moderates, and it was anticipated that the administration coalition of the National Democratic and Antipersonalista Radical parties would win the elections, whether honest or not. Argentine liberal parties, on the other hand, found difficulty in settling former rivalries so that they could organize a united front for an effective opposition campaign.

The "G.O.U." Coup.—The whole political pattern of mid-1943 was rudely upset on June 3-4 by an almost bloodless revolution of a clique of army officers headed by Gen. Arturo Rawson and Gen. Pedro Pablo Ramírez. The group deposed Pres. Castillo and set up a provisional government with Rawson in the presidency; he gave way after two days to Ramírez, and on June 18 the new regime was declared to be permanent. Observers, both in and out of Argentina at first hoped, and many assumed, that the new administration would be less conservative than the Castillo government and would quickly break with Germany and Japan. Such expectations were quickly dissipated by cabinet and other appointments that soon made it apparent that the new government was pursuing a vigorously nationalistic policy and was even more conservative than the one it had displaced. Many of its leaders, including Ramírez, had been associated with Argentine fascist groups. It soon appeared that the inspiration of the new regime was the army "colonels' clique" popularly known as the G.O.U. (Grupo de Oficiales Unidos; the initials were sometimes explained as standing for the slogan Gobierno, Orden, Unidad) and that the dominant figure behind the scenes was the able army officer Col. Juan D. Perón.

An early wave of criticism of the new government's policies was followed promptly by a rigorous proscription of pro-Allied and pro-democratic newspapers; more than 70 papers were suspended in September alone for varying periods, and some editors were jailed. When Bruno Genta, a federally-appointed interventor, removed many liberal faculty members from the University of the Litoral, a serious student protest riot resulted. Additional disturbances occurred in the last two months of 1943 among students in other national universities. The government suspended many pro-Allied organizations on the charge that they were communistic; chief of these was the Junta Feminina de la Victoria, a women's group including many of the most prominent women of the country and engaged in raising supplies and contributions for the Allied cause. Similar attempts against labour unions resulted in extensive strikes, and the government was forced in some cases to modify its position. One of the most serious strikes started in September among employees in meatpacking plants in Avellaneda, a Buenos Aires suburb; before its end on Oct. 4, the strike resulted in the death or injury of several persons during demonstrations. A general strike began late in November at Mar del Plata over the attempted imposition of a heavier tax on bicycles; this strike continued until Dec. 15 and brought not only

the arrest of various labour leaders but also a material reduction in the proposed tax. The government on Dec. 31, 1943, decreed the dissolution of all political parties as of that date. The purposefulness in the new government's program was pointed up by the revelation, late in 1943, of a manifesto secretly issued to Argentine arms officers on March 5, 1943, three months before the revolution, in which German techniques and objectives were lauded and the same sort of totalitarian program advocated for Argentina under the aegis of the army.

Other internal policies of the Ramírez government included a number of measures designed to secure popular support: abolition of the official wine and grain boards, elimination of the much disliked Buenos Aires transportation monopoly, cuts in utilities rates, adoption of a national rental reduction program, a reduction in the civil service for reasons of economy, an increase in pay for government employees, an increase in the minimum wage for farm labour and a 20,000,000-peso increase in farm loans. The new regime took vigorous and nationalistic economic action. Most important was the announcement in mid-September of the decision to repatriate £33,000,000 of Argentina's £46,000,000 of London-held bonds. The British-owned water system serving parts of Buenos Aires province was purchased by the government in May 1913 for 10,000,000 pesos. The year showed a considerable favourable balance of trade, and foodstuffs were generally plentiful, although shortages in fuel oils and rubber were serious; linseed oil and corn were used in large quantities as a fuel substitute.

The high point of development in foreign affairs after the June revolution resulted from the effort made in early September by Foreign Minister Admiral Segundo Storni to obtain lend-lease aid from the U.S. with which to improve and enlarge Argentina's military establishment, especially in view of the large amounts of lend-lease aid currently being obtained by Brazil, Argentina's only South American rival. Secretary Hull's refusal of the request was accompanied by a severe castigation of Argentina's alleged failure to co-operate with the other American republics in maintaining hemisphere security. A political sensation resulted in Argentina and Storni's resignation followed, presumably because of Argentine loss of diplomatic face, but no general change in policy resulted and, indeed, some observers felt that Hull's note tended to rally Argentine opinion to greater support of the government. Gen. Rawson in the same month delayed his departure for Rio de Janeiro to assume his new ambassadorship to Brazil, and instead toured the country making addresses in favour of a break with the axis powers. The government finally had to order him to leave for his post, refusing to accept his proffered resignation. Argentina on Aug. 23 signed a contract with Great Britain, the latter acting on behalf of the United Nations, by which the entire Argentine exportable meat surplus for a two-year period was pledged to Great Britain and other United Nations. The same two countries in November entered into a pricefixing agreement on quebracho.

Argentina also negotiated commercial treaties with Chile and Ecuador during 1943. The 1943 treasury deficit of approximately 734,810,000 pesos was the largest in Argentine history to that date.

The Ramírez government continued on its nationalistic course. On Jan. 5, 1944, it decreed stringent new press regulations, including a prohibition on publication of "anything contrary to the general interest of the nation."

The independent course of action was reflected by Argentine recognition of the revolutionary Bolivian junta, put in power by the coup of Dec. 20, 1943, even though other American foreign offices delayed for some months to consult about the Bolivian situation. The Argentine foreign ministry announced Jan. 21, 1944, the arrest several months earlier, by British officials at Trinidad, of Argentine Consul Osmar Helimuth, en route to Barcelona, Spain, on charges of espionage. Ensuing revelations of axis activity in Argentina, plus some indirect pressure by the U.S. state department, culminated on Jan. 26 in an Argentine break with Germany and Japan. Those powers' ambassadors were given their passports and later steps were taken to complete the rupture. Pres. Roosevelt and Secretary of State Hull hailed the break, though in somewhat cautious terms, pending later indications of genuine Argentine acceptance of a policy of continental solidarity. Severance of diplomatic relations with axis satellites followed on Feb. 4.

Perón Emerges.-These important developments were soon followed by even more dramatic events in domestic politics. A swiftly executed coup by an inner clique among the G.O.U. on Feb. 24, 1944, ousted Pres. Ramírez and put in his place Vice-President Gen. Edelmiro Farrell. The action was allegedly taken because the officers, supposedly extremely nationalistic and noninterventionist, feared the government planned a declaration of war against the axis. Many changes in cabinet and other high positions followed. Two central figures in the struggle for power emerged: Col. Perón, undersecretary of war, who became minister of war on May 4, and Gen. Luis C. Perlinger, minister of government. The contest resulted successfully for Perón when he was named vice-president on July 8, 1944; Perlinger resigned his ministry on July 5. Perón also headed the labour secretariat.

An immediately pressing problem was that of recognition by other governments. Chile, Bolivia and Paraguay all asserted to be under more or less diplomatic and economic pressure from Argentina, extended recognition in March; the other American republics, all of which had promptly recognized the change of regime in June 1943, postponed action and conferred at length over the situation. The administration in the following months took many strongly nationalistic steps, such as the strict regulation of the press and the temporary suspension of many papers (including the outspokenly democratic La Prensa), reparation of portions of the foreign debt, expropriation of foreign-owned public utilities, temporary detention of many former officials (including Gen. Rawson), stricter regulation of foreign enterprises and economic activities, and a heavy rearmament program. The last-mentioned had led by the end of 1944 to the organization and equipment of two armies of six divisions each, three army air force squadrons with four air bases, and four military institutes. The navy by that time included two battleships, three cruisers, 15 destroyers, three submarines, four coast defense ships, four transports, three surveying vessels, two river monitors, two oilers and five tugs; the navy also possessed two bases, three training schools and an air force of three squadrons. The government on May 18, 1944, decreed that all boys of high-school age must serve in the army for 12 months instead of the three previously required, and on Nov. 17 it declared all citizens between the ages of 12 and 50 subject to military training. In the face of a storm of protest against that tender lower age limit the government later asserted that the youth of both sexes

below 20 years of age would receive only athletic training.

Because of the tightening diplomatic situation, most of the representatives of the other American republics, including U.S. Ambassador Norman Armour, were called home late in June and early in July; Argentina retaliated by recalling some of its foreign representatives. A note circulated by the U.S. among the other American republics on July 20 made outspoken charges against the Argentine government, which Foreign Minister Gen. Orlando Peluffo promptly denied. Relations between Argentina and the U.S. continued to deteriorate for some time thereafter, with Secretary Hull attempting to point up a distinction between the Argentine people and that country's government.

Enormous Buenos Aires demonstrations on Aug. 23-24, 1944, celebrating the liberation of Paris (not actually liberated until the 25th) were interpreted as a veiled protest against government policies, and many arrests followed. The government on Sept. 9 announced the withdrawal of its representative on the Committee for the Political Defense of the Hemisphere, at Montevideo, Uruguay, because of that body's critical attitude toward the Argentine regime. Pres. Roosevelt on Sept. 29 strongly denounced the Argentine policy. The foreign ministry precipitated a diplomatic sensation on Oct. 26 by requesting that a fourth foreign ministers' conference be held to consider the inter-American official attitude toward Argentina. Prolonged diplomatic discussions followed, but nothing tangible was announced until the Pan American Union's statement on Jan. 7, 1945, that the request would be deferred indefinitely because of a previous decision to hold an early special conference (which had been hastily arranged in the meantime) on war and postwar problems.

The Pan American Union's announcement of plans for the Inter-American Conference on Problems of War and Peace, to which Argentina was not invited, caused that state to withdraw its representative from the Pan American Union governing board in Jan. 1945; he did not resume his seat until March 12. The special conference, held at Mexico City, Feb. 21-March 8, 1945, consciously subordinated the Argentine question to more general problems. The conference late in its sessions took the position that if Argentina adhered to the steps taken at Mexico City (especially the Act of Chapultepec), declared war on the axis, signed the United Nations pact, and took other measures to demonstrate hemispheric accord, it would be readmitted to the community of American states, presumably prior to the meeting of the United Nations Conference on International Organization at San Francisco in April 1945. Pres. Farrell announced on March 27 that war had been declared against the axis powers in order to "identify the policy of the nation with that of the other American republics." Argentina then asked to sign the Act of Chapultepec and its representative did so at Mexico City on April 4. The government in early April took steps to round up suspected axis agents, close pro-nazi newspapers, and confiscate enemy alien property; U.S. officials later expressed doubt as to the genuineness of some of these measures. The U.S. state department announced on April 9 that all American republics had agreed to resume "normal diplomatic relations" with Argentina. Pres. Harry S. Truman on April 9 nominated Spruille Braden as ambassador to Argentina; Braden presented his credentials at Buenos Aires May 21. After sharp debate in the opening days of the San Francisco conference, with the opposition led by the U.S.S.R., Argentina was admitted to membership. Argentina ratified the

Domestic politics reflected many changes in 1945. Early months were characterized by general unrest and increased

democratic opposition to the regime. The government

stepped up its political arrests and exiling of opponents. Opposition leaders, concentrated principally in Montevideo, found it difficult to form a united front against the Farrell-Perón government. The administration on May 31 published a new and subsequently controversial statute for political parties with various novel features, including compulsory voting and a ban on "exotic ideologies." Correspondent Arnaldo Cortesi published in the New York Times a sensational dispatch charging dictatorial methods and corruption on the government's part; repercussions were heard for several weeks. Buenos Aires newspapers on June 16 published a manifesto by 321 industrial and commercial organizations attacking governmental policies. Despite continuing disturbances, the government on Aug. 6 lifted the state of siege in effect after Dec. 16, 1941. Ambassador Braden, who, during his tenure in Buenos Aires, made several critical statements about the government, was promoted to the position of assistant secretary of state in charge of American republic affairs on Aug. 25, implying a more severe U.S. policy toward Argentina; he left Buenos Aires on Sept. 23.

Gen. Arturo Rawson was arrested on Sept. 25, 1945, for alleged leadership of an attempted revolution. The government on Sept. 26 restored the state of siege. Civilian leaders expressed little faith in Pres. Farrell's earlier announcement that elections would be held before the end of 1945. A coup led by Gen. Eduardo J. Avalos and Adm. Héctor Vernengo Lima ousted Vice-Pres. Perón from his various posts on Oct. 9 and forced considerable governmental reorganization, though Pres. Farrell remained in office. But

Perón, by a countercoup on Oct. 17, succeeded in return-

	1	Argentino 938	afa 1940	1943		
ltem	Value (000's omitted)	Amount or Number	Value (000's omitted)	Amount or Number	Value (000's omitted)	Amount or Number
Exchange rate United States Great Britain		1 peso=32.5 cents 15 paper pesos=£1	•	1 peso = 29.8 cents 17 paper pesos = £1 (Jan. 1, 1941)	·	1 peso = 29.8 cents* 17.4 paper pesos =£1
Finance Government Revenues Government expenditures Gold reserves	\$297,382 (£60,827) \$383,042 (£78,421) \$388,500 (£79,464)			(Juli. 1, 1741)	\$298,236* (£73,912) \$454,366* (£¶12,606)	-21
National debt					\$1,546,380* (£383,242)	
Transportation Railroads Highways Waterways (rivers) Airways		26,531 mi. 264,194 ,, 2,500 ,, 6,470 ,,†				
Communication Telephones Telegraph lines Radio sets		377,473 29,307 mi. 800,000		460,8 <i>57</i> ‡ 29,510 mi.‡ 1,050,000‡		1,336,000
Minerals Petroleum Lead ore (metal		2,680,794 tons		20,609,000 ьы.		
content)		26,125 ,, 4,119,956 oz. 813 tons 16,865 ,,		32,707 tons 3,242,200 oz. 1,585 tons 40,785 ,,		
Crops Wheat Corn Sugar cane Linseed Vineyards Potatoes		6,227,995 tons 4,876,575 " 4,638,991 " 1,708,356 " 1,429,419 " 1,049,390 "		3,583,577 tons 12,156,164 ,, 572,094 ,, 1,103,843 ,, 1,180,563 tons		7,054,720 tons 2,138,462 ,, 1,681,008 tons 1,137,290 tons
Livestock Sheep		43,790,166 33,100,000 8,527,000				50,902,000* 31,460,000* 6,757,000*
Forest products Quebracho extract§ Quebracho logs§ Manufactures		185,120 tons 96,166 ,,		167,741 tons 34,631 ,,		
Food, beverage and tobacco	\$1,526,553† (£344,206) \$518,183† (£116,839) \$215,630† (£48,620) \$123,785† (£27,911) \$122,943† (£27,721)					
Exports Total Meat (frozen and chilled) Wheat Linseed Corn Wool	\$411,873 (£84,245) \$72,006 (£14,728) \$53,941 (£11,033) \$53,298 (£10,902) \$53,091 (£10,859) \$45,218 (£9,249)	10,052,000 tons 557,000 ,, 2,139,000 ,, 1,395,000 ,, 2,912,000 ,, 167,000 ,,	\$425,051 (£110,979) \$75,643 (£19,750) \$84,447 (£22,049) \$35,479 \$25,392 (£6,630) \$58,055 (£15,158)	4,012,000 tons 829,000 ,, 2,066,000 ,,	\$542,191 (£134,372) \$84,366 (£20,909) \$40,182 (£9,958) \$38,752 (£9,604) \$3,667 (£909) \$41,229 (£10,218)	5,866,000 tons 519,000 ,, 2,155,000 ,, 713,000 ,, 210,000 ,, 98,000 ,,
Imports Total	\$421,999 (£86,316) \$85,571 (£17,503) \$68,096 (£13,928) \$67,412 (£13,789)		\$321,348 (£83,903) \$56,009 (£14,624) \$56,152 (£14,661) \$31,875 (£8,322)	 	\$280,476 (£69,511) \$66,536 (£16,490) \$26,795 (£6,641) \$11,124 (£2,757)	
Defense Standing army personnel Reserves Standing army personnel Standing air force personnel Military expendi-	\$54,570	49,705 282,503 15,500 2,032		49,705 282,503 15,500 2,032	(22,131)	,
tures Education Elementary schools Enrolment Secondary schools Enrolment Private schools Enrolment Universities Enrolment *1942,	(£11,162)	‡19 4 1,	§Ex;	13,615 1,929,818 445 75,903 1,167† 75,903† 7 30,000 ports only.		

Argentina: Statistical Data

ing to power (though he did not resume his offices) with the mass support of certain labour elements which had been backing him for the presidency. The government on Nov. 14 set Feb. 24, 1946, as the date for elections, and in the meantime Perón made his long-delayed formal announcement of candidacy. The government on Dec. 20, supposedly to aid Perón's candidacy, which it supported, decreed a general 10% to 25% wage increase and payment of a Christmas bonus of one month's salary; this encountered an adverse judicial decision on March 23, 1946. On Dec. 30, 1945, the Democratic Union, a coalition composed of the Radical party and other opposition groups, nominated José P. Tamborini and Enrique P. Mosca as its presidential and vice-presidential candidates respectively.

The government in July 1945 announced plans for a large housing program, involving the expenditure of 200,000,000 pesos annually for 20 years, to supplement its slum-clearance projects. The U.S. and Argentina concluded an agreement on May 10, 1945, for large-scale purchase by the U.S. of linseed and vegetable oils in return for the supply of large quantities of fuel oils to supplement inadequate Argentine fuel resources. Argentina on Aug. 4 announced consummation of a trade pact with Sweden. Late in 1945 it gave notice of intention to end the 1936 trade agreement with Great Britain, effective Feb. 21, 1946.

The Labour party, a Perón creation, and a dissident pro-Perón wing of the Radical party in Jan. 1946 nominated Dr. Hórtensio J. Quijano as Perón's running-mate. Campaigning in January and until the elections of Feb. 24 was frantic, with the opposition charging that the government was throwing every possible obstacle in the way of its candidate, Tamborini. Perón on Jan. 30 charged that the U.S. embassy was involved in smuggling arms into Argentina (the foreign office later repudiated the charge), but on Feb. 9 he made a bid for closer relations with the U.S. The U.S. state department on Feb. 12 published a startling memorandum on the Argentine situation in which it charged negotiations for nazi military assistance to Argentina, efforts by the latter government to subvert the governments of neighbouring countries, Argentine-nazi political and social collaboration, and the existence of a strongly fascistic government in Argentina. This "Blue Book" was a diplomatic bombshell and caused strong attacks by Perón on Spruille Braden as well as formal repudiations by the Argentine government.

Perón President.-If the "Blue Book" was designed to bring about Perón's defeat on Feb. 24, 1946, it failed badly. The election was peacefully held, the votes apparently were honestly counted, and, to the surprise of many observers, Perón won an overwhelming triumph, the final electoral vote being announced as 304 for Perón to 72 for Tamborini; the popular votes were respectively 1,474,-447 and 1,207,359. Composition of the new congress was 109 pro-Perón deputies against 49, and 26 favourable senators against 4 anti-Perón senators. Some observers subsequently explained the victory on the basis of Perón's successful cultivation of the labouring classes with many promises of betterment of their condition. The Democratic Union was formally dissolved on April 16; Perón on May 23 announced the merger of all parties which had supported him into one new one, the National Revolutionary party.

The U.S. on March 21, 1946, notified all other American governments except Argentina that it would not

sign a proposed permanent hemispheric peace and security pact, anticipated by the Act of Chapultepec, if the Perón government were a signatory; this position was in effect reversed in early April, however. At about the same time George Messersmith, U.S. ambassador to Mexico, who had taken a prominent role in getting Argentina admitted to the San Francisco conference, was named U.S. ambassador to Argentina; he and Sir. R. W. A. Leeper, the new British ambassador, both arrived in Buenos Aires on May 22. Various steps toward a rapprochement occurred later in the year, notably attendance by Pres. Perón at a U.S. embassy dinner given Aug. 9, 1946, for Oscar Ivanissevich, newly named Argentine ambassador to the U.S.

The chamber of deputies met April 29 for the first time after 1943, with Perón forces in full control. The state of siege was again lifted on May 24. Various nationalistic steps occurred in the early months of 1946: a decree of March 25 nationalized the Central Bank of the Argentine Republic; a new tax law in May heavily penalized absentee land-owning; the government on May 30 put stock exchanges and export and insurance businesses under national control; the Perón-controlled paper El Laborista predicted that various foreign-owned oil concessions would be expropriated. On May 31, 1946, Perón was reinstated on the army active list and promoted to be a brigadier general, effective Oct. 17, 1945. Inauguration of Perón and Quijano took place with elaborate ceremonies on June 4, third anniversary of the coup that had brought the military clique to power. Perón declared on Aug. 1, 1946, that in the event of another world war Argentina would fight on the side of the U.S. The government on July 16 announced a decision to retire all outstanding foreign dollar and Swiss-franc debt, estimated to total more than \$125,000,000.

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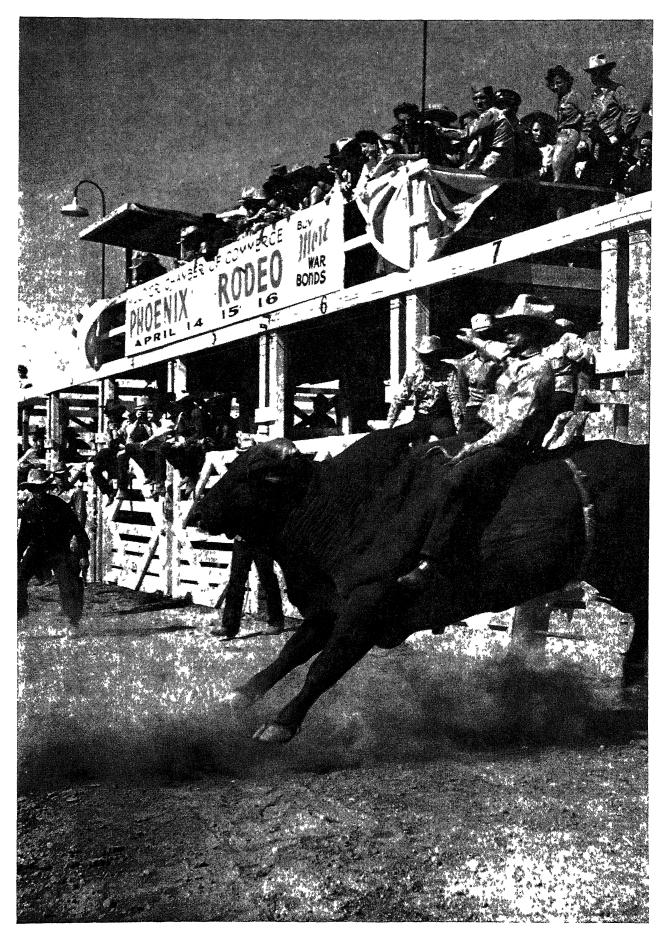
"Argonaut" (Crimea) Conference

See International Conferences, Allied (World War II).

Arizona

The "Grand Canyon state" lies in the southwestern part of the United States. It borders Mexico on the south; the Colorado river forms most of the western boundary. Arizona and New Mexico are the youngest states of the United States, both being admitted in 1912. Area 113,909 sq.mi. including 329 sq.mi. of water. Population (1940) 499,261, including 65.2% classified as rural and 34.8% as urban. Native and foreign-born whites (including Mexicans) numbered 389,955 and 36,837 respectively; Negroes 14,993; other races (mostly Indian) 57,476. Estimated population in 1944, 638,412. The capital is Phoenix with a population (1940) of 65,411. Chief cities are: Tucson (36,818); Douglas (8,623); Mesa (7,224); Globe (6,141); Prescott (6,018); Bisbee (5,853); Yuma (5,325); and Flagstaff (5,080).

The state officials in 1937 were: chief justice, A. G. McAlister; governor, R. C. Stanford; secretary of state,



J. H. Kerby; attorney general, J. Conway; treasurer, H. M. Moore; auditor, Ana Frohmiller; superintendent of public instruction, H. E. Hendrix. The governor and the entire legislature, with one exception, were Democratic. The governor's chief plank was his proposal to increase taxes on mines and railroads and to reduce the sales tax by a corresponding amount, with foodstuffs, fuel and cheaper clothing to be eliminated entirely from the sales tax. Owing to conflicting interests within the legislature and also to those between the legislature and the executive, three special sessions were called, the last adjourning Aug. 4, 1937. The governor's sole victory in the special sessions was the provision that 60% of the sales tax be returned to the counties to relieve them of depression-caused debts.

The November election of 1938 for the state returned the incumbents with three exceptions: Robert T. Jones, governor; H. M. Moore, secretary of state; and William Peterson, treasurer. At the November election of 1940 Sidney P. Osborn was elected governor; Joe Hunt, treasurer; and Alfred C. Lockwood became chief justice. In the presidential poll, Roosevelt received 95,267 votes; Willkie, 54,030. Ernest W. McFarland was elected U.S. senator, having defeated Senator Henry F. Ashurst in the September primary.

Governor Osborn in 1941 proposed the consolidation of bureaus and offices, a new board of control for the state hospital, and an increase of old-age pensions from \$30 to \$40 per month. The last two measures were formulated into law.

Arizona.	Statistical	Data

T	able I.—Ec	lucation (Pub	olic)		
	1938	1940	1942	1944	1945
Elementary school pupils	89,708 20,348 2,404 747	22,245 2,670	92,780 23,650 3,044 937	91,893 20,435 2,659	93,058 22,074 2,751 931
•	Table II.—	Public Welfo	ıre		
1938	1939	1940	1941	1942	1945
Persons receiving aid 25,29 Monthly cost of aid . \$919,55	5 37,97 3 \$667,25			36,091 288,899	25,165
Т	able III.—	Communicati	ons		
	1938	1939 19	41 1943	1944	1945
			3,678 180 2,165		3,824 2,208
Tab	le IV.—Ba	nking and Fi	nance		
(All mone	y figures i	n thousands	of dollars)		
1938 National bank	1941	1942	1943	1944	1945
	5 \$70,200 30,45	2 \$87,864 34,665		190,072 \$ 61,271	246,828 77,530
	Table V.	—Agricultur	e		
	(All figures	in thousand	is)		
1	937 193	39 1941	1942 19	43 1944	(est.)

Table VI.—Mineral Production (All figures in thousands of dollars)

Wheat, bu....
Oats, bu....
Sorghum grain, bu.

Oranges, boxes . . .
Horses, head
Cattle and calves, head
Sheep and lambs, head

				1 <i>937</i>					1943	
Copper				\$69,812	\$41,316	\$54,519	\$63,544	\$77,864	\$104,325	\$96.74
									6,055	3,92
					4,835	5,311	5,031	5,370		3,124
Zinc									4,294	6,629
Lead .	٠	٠	٠	1,458	973	1,012			1,805	2,673

In the November elections of 1942, all state officials were re-elected with the exception of Joe Hunt, who was elected state tax commissioner; J. D. Brush was elected treasurer of the state. Secretary of State H. M. Moore died during the year and Dan E. Garvey was appointed by the governor as his successor. A special war session of the 15th state legislature passed several measures, including a bill providing for a civilian defense board and a defense council. Archibald G. McAlister, chief justice, was the only new state official in 1943. The legislature passed 96 acts during 1943, including an act authorizing the signing of a contract between the United States and Arizona providing for "delivery for use in this state of all such waters of the Colorado river as are available for use in this state."

The state officials in 1944 were: chief justice, Archibald G. McAlister; governor, Sidney P. Osborn (re-elected 1944); secretary of state, Dan E. Garvey (re-elected 1944); treasurers, James D. Brush and by appointment Alva Weaver (William T. Brooks elected 1944); attorney general, Joe Conway (John L. Sullivan elected 1944); superintendent of public instruction, E. D. Ring (re-elected 1944). The vote in the presidential election (1944) was: Roosevelt 80,926, Dewey 56,287. The legislature ratified the Santa Fe compact and the contract calling for delivery to Arizona of 2,800,000 ac.ft. of water from Lake Mead, gave the right of voting to soldiers and established a change of time. Chief Justices Henry D. Ross (died Feb. 9, 1945) and Rawghlie C. Stanford were new state officials in 1945. The legislature during 1945 passed a measure providing for a single board of regents for the University of Arizona, Tucson, Ariz., and the two state teachers' colleges, made provision for a survey of the use and supply of underground water for irrigation and for evaluating gas and electric plants as a basis for rate-making.

Governor Osborn and all state officials were re-elected on Nov. 5, 1946, except the treasurer and the superintendent of public instruction; Mit Simms and Nolan D. Pulliam were elected, respectively, to the latter offices.

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Arkansas

Located in south-central United States, Arkansas was the 25th state admitted to the union (1836). Its older popular name was "Bear State," the newer (by act of the legislature), "Wonder State." Area, 53,102 sq.mi., including 377 sq.mi. of water. Population (1940) 1,949,387, of which 22.2% was urban. The white population was 1,466,084; Negro, 482,578; other, 725; foreign born, 7,692. Estimated population (1944), 1,776,446. The capital is Little Rock (pop. 1940, 88,039). Other cities: Fort Smith (36,584); Hot Springs (21,370); Pine Bluff (21,290); North Little Rock (21,137); El Dorado (15,858), Texarkana (11,821).

State officials in 1937 were: governor, Carl E. Bailey; lieutenant governor, Bob Bailey; secretary of state, C. G. Hall; attorney general, Jack Holt; comptroller, J. O. Goff. Important bills passed by the 1937 legislature included those creating a department of public welfare, establishing a merit system for office holders, refunding the debt, prohibiting competition of prison labour with free labour, creating a commission for interstate co-operation, changing the sales tax, providing for unemployment compensation, providing for soil conservation, revising the corrupt practices act, enacting a retirement act for teachers, providing for housing authorities in certain cities and for a state police. An amendment to the constitution exempted home-

steads from state taxes, and another act gave power of reapportionment to a commission consisting of the governor, the secretary of state and the attorney general.

Constitutional amendments adopted in 1938 included those allowing the legislature to pass a workmen's compensation act, giving the supreme court authority to regulate the legal profession, exempting new factories and extensions of old ones from state taxation for ten years, regulating appointments to fill vacancies and providing for nomination by majority vote only. An amendment to substitute registration for the payment of a poll tax as a prerequisite for voting was defeated by a large majority.

In the 1940 presidential election in the state Roosevelt received 158,622 votes, Willkie, 42,224. State officials elected for a two-year term were: Homer M. Adkins, governor; Bob Bailey, lieutenant governor; C. G. Hall, secretary of state; Jack Holt, attorney general; Otis Page, land commissioner; Earl Page, treasurer; J. Oscar Humphrey, auditor; J. S. Holt, associate justice of the supreme court. The Communist party was ruled off the ballot on the ground that it did not "subscribe to the principles of Americanism."

Legislative acts of importance in 1941 were: the refunding of the highway debt with the RFC at a lower rate of interest; a measure allowing cities of the first class to levy taxes to pay salaries and pensions of firemen and policemen; establishment of civil service in cities with a population of 20,000 or more; authorizing the governor to join interstate compacts for the conservation of oil and gas; forbidding political parties to name candidates except through primaries or conventions.

In the November elections of 1942 the following new officers were elected: J. L. Shaver, lieutenant governor; Guy E. Williams, attorney general; Claude E. Rankin, land commissioner. Three new members were elected to the supreme court, Ben E. Carter, Edward F. McFaddin, R. W. Robbins. Two new members were sent to the house of representatives, J. W. Fulbright and Brooks Hays. John L. McClellan was sent to the senate. Although about 300,000 had paid the poll tax, fewer than 100,000 went to the polls. Four amendments to the constitution, one referred act and one initiated act were submitted to the electors. Two amendments were adopted, one to allow counties to support hospitals by taxation and the other to "freeze" boards of state institutions and to "stagger" terms so that it would be impossible for the governor to get control. The initiated act, reducing the number of signatures required to submit a local option measure, was adopted. The referred "lawyers bill", to require the employment of lawyers in certain cases, was defeated.

The aluminum plant situated near Lake Catherine went into operation in 1942, making aluminum out of ore mined a few miles away. Arkansas could now produce 180,000,000 lb. a year. Sour gas from south Arkansas was being used for fuel in the aluminum plant. Arkansas secured several war industries, army camps and flying fields at a cost, according to Governor Adkins, of \$350,000,000. Two colonies of Japanese who had been evacuated from the west coast, were established in the state. (D. Y. T.; X.)

The general assembly met in Jan. 1943 for its 54th regular session. Except for passage of the Abington bill, which outlawed the forcing of strikes by violence, controversial measures were significantly avoided.

In the biennial state election of Nov. 7, 1944, Ben T. Laney was elected governor; C. G. Hall, secretary of state; J. O. Humphrey, auditor; J. L. Shaver, lieutenant governor; J. V. Clayton, treasurer; Guy E. Williams, attorney general; C. A. Rankin, land commissioner. Amendments

guaranteeing the right of the individual to work without union affiliation, creating a game and fish commission, and allowing servicemen to vote without payment of poll tax, were adopted. Acts to repeal the law legalizing horse and dog racing and to establish a system of state hospitals, were defeated. In the presidential election, Arkansas cast a total vote of 212,954, of which 148,965 went to the Democratic party, 63,551 to the Republican and 438 to other parties.

The chief accomplishments of the Laney administration during 1945 were a reduction in state employees and total expenses; consolidation of all natural resource agencies

expenses; consolidation of all natural resource agencies
Arkansas: Statistical Data
Table 1.—Education (Public)
1938 1940 1942 1943 1945
Enrolment
Number of teachers 12,738 13,173 13,066 13,600 12,770
Table II.—Public Welfare
(All money figures in thousands of dollars)
1937 1938 1939 1940 1941
Cases on general relief
Recipients of old-age pensions 17,277 19,755 26,046 Cost of pensions \$106 \$149 \$200
Dependent children receiving aid 11,186 12,147 16,486
Blind receiving aid 622 812 1,142 Workers under unemployment
compensation
Table III.—Communications
1937 1938 1939 1941 1942 1943
State highway mileage 9,280 9,352 9,289 9,289
Railroad mileage 4,577 4,538 4,527 4,538 4,538 5,000
Table IV.—Banking and Finance
(Money figures in thousands of dollars)
1937 1939 1942 1943 1944 1945
State debt \$159,066 \$153,279 \$145,925 \$142,218 \$139,131 \$133,540 Number of banks . 223 216 216 212 212 210
Total deposits \$163,400 \$176,500 \$349,484 \$436,114 \$508,752 \$665,918 Natl. bank deposits \$99,162 \$116,217 \$175,424 \$245,961
Train dam deposits 417/102 4110/21 4110/104
Table V.—Agriculture
(All figures in thousands)
1937 1939 1941 1942 1943 1944 1945 Cotton, bales . 1,904 1,413 1,450 1,485 1,841 1,960 1,080
Corn. bu 40.640 32.318 46.032 37.116 25.262 32.016 35.511
Peaches, bu 2,288 2,615 3,042 2,337 738 2,646 2,967
Table VI.—Manufacturing
(All money figures in thousands of dollars)
1937 1939 1943 1944 1945
Wage earners 37,280 36,256 Wages paid \$24,734 \$24,577
Value of products \$164,676 \$160,167 \$619,000 \$618,000
Value of lumber products \$35,963 \$35,222 \$100,000
Table VII.—Mineral Production (All figures in thousands of dollars)
1937 1939 1940 1941 1942 1943
Total value of
production \$25,578 \$29,507 \$33,705 \$55,472 \$80,864 Petroleum 11,400 16,931 21,239 \$24,210 26,300 27,300 Coal 5,333 4,103 4,480 4,930 7,551 8,315 Bauxite 2,293 2,804 4,783 12,029 31,448
Coal 5,333 4,103 4,480 4,930 7,551 8,315 Bauxite 2,293 2,804 4,783 12,029 31,448
Natural gas 1,984 343 378 739 3,027 3,900
Natural gasoline . 754 520 984 1,138 1,550

into one, with resulting economy and efficiency; improved finances for public schools; and a new method of allocating state revenues to vital services which largely eliminated earmarking of special tax levies and assured continuous operation of necessary service during periods of reduced income.

All the principal state officers were re-elected in Nov. 1946, for two-year terms, except the lieutenant governor, who was not a candidate. Nathan Gordon became lieu-

tenant governor for 1947 and 1948.

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Armenian S.S.R.

See Union of Soviet Socialist Republics.

Armies of the World

See Aviation, Military; Compulsory Service, British; Law; Selective Service, U.S.; World War II. See also under various countries.

Armoured Warfare

See TACTICS OF WORLD WAR II; WORLD WAR II.

Arms Embargo

See International Law; Republican Party; United States.

Army Specialized Training Program

See Education.

Arnim, Dietloff Juergen von

Arnim (1891?-), German army officer, was born of a wealthy and noble family. Little information on his early military career became available; it was known, however, that he worked with Erwin Rommel prior to World War II on plans for building up the wehrmacht's panzer forces. Although an expert in mechanized warfare, he served in the Polish campaign (1939) as commander of an infantry division. After Rommel's recall to Germany in March 1943, for "reasons of health," Arnim was over-all commander of German forces in Tunisia. Under his direction, the Afrika Korps put up a strong defense of the so-called "coffin corner" of Tunisia, but Allied superiority in arms and manpower soon wore down the resistance of the German forces. After Allied armies took Bizerte and Tunis on May 7, 1943, Arnim's units were driven back to the Cape Bon peninsula. Taken prisoner on May 12, 1943, he requested surrender terms from Gen. K. A. N. Anderson, commander of the British 1st army.

Upon learning that he would be given only "unconditional surrender," Arnim angrily refused to sign. However, his armies were already surrendering in droves. In a final message to Hitler, Arnim wrote: "I report that the order to defend Tunisia to the last cartridge has been carried out." Von Arnim was despatched to England for internment and was subsequently shifted to the United States.

Arnold, Henry H.

Arnold (1886—), U.S. army officer, was born June 25, 1886, in Gladwyne, Pa. After graduating from the U.S. military academy at West Point in 1907, he served two years in the Philippines. During World War I, he was assigned to the signal corps aviation division and later became assistant director of military aeronautics. Gen. Arnold, who was named assistant chief of the air corps in 1936, became a major general and chief of the air corps two years later. In 1940 he was appointed deputy chief of staff for air. In the spring of 1941, Gen. Arnold went to England to exchange technical knowledge with British air experts and in December of that year Pres. Roosevelt named him for temporary promotion to the rank of lieutenant general. In March 1942 Arnold was made com-

mander of the U.S. army air forces, which were given equality with the ground forces. He was promoted to a full general in 1943 and in 1944 was raised to the highest military rank—general of the army. On Jan. 24, 1946, Gen. Arnold was succeeded as head of the army air force by Gen. Carl A. Spaatz.

Arnold, Thurman Wesley

Arnold (1891—), U.S. attorney and government official, was born June 2, 1891, in Laramie, Wyo. After completing his law studies at Harvard (1914), he practised law in Chicago and later in Laramie. During World War I, he served in France as an officer in the field artillery. He was dean of the West Virginia university college of law from 1927 to 1930, and professor of law at Yale university in 1931. Four years later he was appointed trial examiner for the Securities and Exchange commission.

Arnold was the target of anti-New Deal attacks after publication of his work, The Folklore of Capitalism (1937), in which he referred to U.S. law and classical economics as a compound of myth and fiction. Shortly thereafter, he was appointed assistant attorney general by Pres. Roosevelt (March 1938). In this office, Arnold conducted a concerted anti-trust drive; he filed suits against the major motion picture companies (1938), employers and unions in the building industry (1940), and the Associated Press (1942). On July 5, 1945, Pres. Truman announced that he had regretfully accepted his resignation.

Arsenic

The output of white arsenic in the major producing countries during 1937-45 is shown in Table I.

Table I .- World Production of Arsenic

	(The	usands	of shor	t tons)				
	1937	1939	1940	1941	1942	1943	1944	1945
Australia Belgium (exp.)	2.30 3.35	1.59 3.67	3.73	3.78	3.05	2,56	2,58	ş
Brazil	0.79	0.78	1.19	1.29	0.99	0.93	ş	Š.
Canada	0.69 7.17	0.87 ?	1.05	1 <i>.77</i> 6.77	3.92 2.49	1.58 4.12	1.31	1.02
Germany (exp.)	3.14	1.96	? 1.41	² 1.32	3.95	6,18	\$	š
Mexico	11.86	7.79	10.22	14.16	20.41	22.39	16.87	16.55
United States	16.81		24.98	32.48	28.68	31.20	36.09	24.35
Total	61. <i>7</i>	69.5	79.2	ş	ş	ş	ş	ş

Although world data were not yet sufficiently complete at the end of 1946 to estimate the total output from 1940, the figures available indicated a maximum of the order of 90,000–100,000 tons in 1943, with subsequent decline. In addition to the countries listed in Table I, Sweden was an important producer of crude arsenic, as a byproduct from arsenical gold ores, only small amounts of which were refined for sale, as the supply greatly exceeded demand. After World War II the Swedish stocks of crude, estimated to be of the order of 400,000 tons, could be distributed to meet European demands, lightening the demand on Mexico and the United States.

Table II.—Data of the Arsenic Industry in the United States
(Thousands of short tons)

						Produ	etion		lm-	Ex-	Con-	
						Crude	Refined	Total	Sales	ports	ports	sumption
1937	٠					9.9	6.9	16.8	17.6	19.3	2.2	34.7
1938						12.6	4.1	16.7	13.2	14.2	2.3	25.1
1939		٠				1 <i>7</i> .5	4.8	22.3	22.4	14.7	3.2	33.9
1940						18.2	6.7	25.0	23.3	9.9	1.6	31.6
1941						26.8	5.6	32.5	34.8	10.3	2.1	40.4
1942				٠		25.7	3.0	28.7	31.0	16.4	0.3	41.5
1943						26.3	4.9	31.2	32.4	16.1	2.0	51.1
1944					٠	31.2	4.9	36.1	34.5	10.0	2.4	43.5
1945						21.4	3.0	24.3	24.8	13.1	0.0	30

Although U.S. production increased materially during the war years, and consumption increased more than production, the advances in consumption were largely in es-

tablished uses, rather than war uses, especially insecticides and weed killer. There was some war use of arsenic, but information was lacking on the amount and the specific uses. Arsenic is a constituent of the war gas lewisite, and apparently much of such war demand as did develop was for this product, none of which was actually used; its manufacture was only a precaution, so as to be prepared if the axis nations instituted the use of gas warfare. Demand for arsenical pharmaceuticals, which nearly trebled between 1939 and 1942, was greatly reduced by the substitution of penicillin for arsenicals in the treatment of venereal diseases, as well as by the demobilization of the armed forces.

While U.S. consumption in 1945 had declined almost a quarter below the high of 1943, it was still 15% higher than in any prewar year.

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(G. A. Ro.)

Art

See Architecture; Art Exhibitions; Art Galleries and Art Museums; Etching; Painting; Photography; Sculpture; etc.

Arteaga y Betancourt, Manuel

Cardinal Arteaga y Betancourt (1879—), Cuban prelate, was born Dec. 28, 1879, at Camaguey, Cuba. His family emigrated to Venezuela for political reasons, and Arteaga was ordained in Caracas in 1904. After representing the Caracas archdiocese at the International Eucharistic congress in Madrid, Spain, he returned to Cuba in 1911. He was named archbishop of Havana in December 1941, and was consecrated the following February.

Arteaga, who was a member of the Third Order of St. Francis and the Knights of Columbus, served the Havana council as chaplain. Venezuela awarded the archbishop the Simon Bolivar Soles y Rayos decoration while Cuba conferred upon him the Order of Carlos Manuel de Cespedes. During his administration of the See of Havana, he built the Good Shepherd seminary at Arroyo Arenas and a number of churches and chapels. He was nominated to the College of Cardinals on Dec. 23, 1945, and was proclaimed cardinal at the consistory in Rome, Feb. 18, 1946.

Art Exhibitions

During the ten years 1937-46 art exhibitions increased to an enormous extent. Several new museums were completed before World War II curtailed building activities, many new sales galleries opened and throughout the United States exhibition programs were greatly expanded. Rising attendance figures indicated that many more people were going to see exhibitions; public interest in art was aroused and the standard of public taste was raised.

Prewar U.S. Exhibitions.—The year 1937 started out significantly with a comprehensive exhibition of America's most important "old master," John Singleton Copley, at the Metropolitan museum in celebration of the bicentennial of the artist's birth (a date which, however, was subject to dispute). This sounded the note of a decade which was to emphasize American art. Forty-eight paintings afforded a rare opportunity to study all phases of Copley's work and asserted once more the importance of this straightforward, uncompromising New England limner.

With equal thoroughness, the Whitney museum celebrated the centennial of Winslow Homer's birth with a comprehensive showing of 170 paintings and water colours

as well as prints and drawings. Thus the most American painter of the 19th century could be seen in all his force-fulness and vigour.

A unique and fascinating event was arranged at the Albright Art gallery in Buffalo, N.Y., under the title, Master Bronzes. Five thousand years of the bronze caster's art was demonstrated with 173 pieces, every one of which was a perfect specimen of this most exacting craft. China, ancient Greece, Renaissance Italy and contemporary artists were all represented in supreme specimens.

Another unique exhibition, The Dark Ages, was shown at the Worcester museum. With material from the excavations at Antioch, Syria, the art of this little-known period was shown through mosaics, sculpture and various minor arts.

Still more ancient was the collection of 150 prehistoric rock pictures shown at the Museum of Modern Art. By means of the extraordinary copies made by Frobenius, the public was enabled for the first time to become familiar with spirited scenes of hunting and other attivities made thousands of years before the dawn of recorded history.

Of enormous interest was the Museum of Modern Art's comprehensive survey of photography beginning with Daguerre's first successful experiments of 1839. From his name came the daguerreotype which in the 1840s was so popular that it threatened to displace portraiture. David Octavius Hill, Mathew Brady, A. Nadar, Alfred Stieglitz, Charles Sheeler, Man Ray and many other notable photographers were shown to advantage. (See also Photography.)

Nineteenth century France was the subject of three memorable exhibitions: Daumier, the great satirist, at the Philadelphia museum; Renoir, the sensual colourist, at the Metropolitan museum; and the most comprehensive group of Manets ever assembled in the U.S. at the Durand-Ruel galleries.

In 1938 the Museum of Fine Arts in Boston held another large and important Copley exhibition to celebrate the 200th anniversary of the artist's birth. Another bicentennial took place at the Philadelphia museum, where Benjamin West was accorded the first major exhibition in a number of years.

Two memorial exhibitions of unusual interest were held at the Whitney museum, Charles Demuth and William Glackens. Much forgotten material was brought to light in the Whitney's Century of American Landscape Painting, 1800–1900.

Another significant note in the American field was the showing of two brothers, Charles and Maurice Prendergast at the Addison gallery in Andover.

If Buffalo in the previous year had attracted interest to the wide use of bronze, the Metropolitan museum in 1938 emphasized the importance of bronze in one area, namely, China. A princely assemblage of 372 pieces represented a period from the earliest known examples in the Shang dynasty to the Sung dynasty (960–1279 A.D.).

Also at the Metropolitan was another exhibition of metal—a handsome group of rare French domestic silver from the 16th to the 19th century. The palace of the Legion of Honor in San Francisco attracted nation-wide attention with a splendid exhibition of Venetian painting. Chicago's Art institute, also in the Venetian field, assembled a brilliant group of paintings and drawings by Giambattista and Giandomenico Tiepolo. In quite a different vein, Mrs. Josephine Hancock Logan, in opposition to progressive or modern trends in art, organized the Society

for Sanity in Art and put on a reactionary exhibition at the Chicago galleries.

In 1939, the Metropolitan museum assembled an exhibition of Augustan art to celebrate the 2,000th anniversary of the birth of Emperor Augustus.

A joint endeavour of the Worcester and Philadelphia museums was the International Exhibition of Flemish Paintings. Precision of technique and exquisite colour marked this rare school of painting which was so well exemplified. Loans from Europe, such as the Memling "Martyrdom of St. Sebastian" from the Royal museum in Brussels, were significant additions to the group.

A full-length exhibition of 40 years of the work of Pablo Picasso, arranged jointly by the Museum of Modern Art and the Art Institute of Chicago, made an overwhelming impression and won many adherents for modern art.

The Two World's Fairs.—Both 1939 and 1940 were banner years for art in the United States (although war had broken out in Europe), because of the two international fairs—at San Francisco and New York—held in those two years.

San Francisco's fair was the first to open and not only had an excellent survey of contemporary American art but also covered the European field and showed most attractively the primitive arts of the Pacific basin. The great feature, however, was the outstanding loan from the Italian government which included such world-famous masterpieces as Verrocchio's bronze David, Michelangelo's marble relief of the Madonna and St. John, Botticelli's "Birth of Venus," and Raphael's "Madonna of the Chair." This priceless collection was later shown at the Art Institute of Chicago and at the Museum of Modern Art.

New York had murals and sculpture specially done by notable artists in various buildings throughout the fair. In addition there was "American Art Today," a comprehensive cross section of contemporary art, and a special group of old masters which were given added lustre by foreign loans such as Pieter de Hooch's "Linen Cupboard" and Vermeer's "Milkmaid" from the Rijksmuseum in Amsterdam and Chardin's "Grace before Meat" from the Louvre.

During 1940, the two world's fairs continued with emphasis on art. San Francisco staged Art in Action and a fascinated public watched sculptors hew wood and chip stone and painters wield their brushes—including Diego Rivera at work on a large mural. New York arranged an entirely new and even better exhibition of old masters.

Arts of the Middle Ages, 320 top quality paintings, tapestries, manuscripts, ivories and other objects made an outstanding showing at the Boston Museum of Fine Arts.

1940 and After.—A great exhibition of Persian art was arranged in the old Union League club in New York where magnificent carpets, textiles, ceramics and manuscripts were greatly admired despite the disadvantageous setting.

Twenty Centuries of Mexican Art at the Museum of Modern Art afforded the first extensive survey of the art of the U.S. neighbour south of the border. In Pittsburgh, the Carnegie museum put up a well-chosen Survey of American Painting in which the Colonial section showed up to special advantage.

Eastman Johnson (1829–1906), famed for his painting, "My Old Kentucky Home," was revived in an exhibition of 100 paintings and many drawings at the Brooklyn museum.

Though the closing of the two great fairs might seem to have left a gap in available exhibitions, the year 1941 had a full quota of notable showings. The great exhibition of

French paintings of the 19th and 20th centuries, sent by the French government to South America, arrived at the DeYoung museum in San Francisco and went subsequently to the Art Institute of Chicago and the Metropolitan museum, and ultimately found refuge for the duration of World War II at the National gallery in Washington. Ingres' "Turkish Bath" was perhaps the most outstanding picture but every phase of development of French painting was admirably shown.

The Baltimore museum did a fine exhibition of the work of Mary Cassatt, the Pittsburgh girl who became a leading figure among the Impressionist painters of Paris. Another superb Renoir exhibition, this time with 86 pictures, was arranged at Duveen's in New York. The Museum of Modern Art showed the Art of the American Indian in a carefully selected and deftly installed exhibition which proved once and for all the great artistic merit that is inherent in so much material which was formerly dismissed as merely ethnological. Later in 1941 the museum put on a duet, Salvador Dali and Joan Miro, in which Dali showed himself to be a surrealist trickster and Miro was established as an abstract artist of unquestioned distinction.

Coptic art was featured in an exhibition of unusual interest at the Brooklyn museum, and Chicago's Art institute showed a carefully selected group of the paintings and prints of Goya.

The American Scene.—In 1942, there was a definite accent on the U.S., although there were two or three notable exceptions. With the greatest treasures of all of the eastern museums put away as a precaution during the war, the Metropolitan museum's showing of their 16 top Rembrandts came as a breath-taking event. Such favourites as the "Artist's Son," "Titus" and the "Old Woman Cutting Her Nails" seemed to have acquired even finer attributes.

Henri Rousseau, the French "primitive," was given a sympathetic showing at the Art Institute of Chicago. The "Sleeping Gypsy," always a great favourite, was surrounded by jungles, toy landscapes, and woodenlike figures, many seldom seen in exhibitions.

At the Whitney museum the history of American water colour from Copley and Trumbull down to modern times was admirably demonstrated. U.S. artists had brought this medium to a perfection not attained in any other country. Homer and Sargent showed the great possibilities of water colour and were the forerunners of a host of artists in this field.

Two little-known 19th century American painters, John Quidor (1801–1881), and William Sidney Mount (1807–1868), were brought to light in a delightful exhibition at the Brooklyn museum.

The directions that American painting was tending to take were clearly indicated by an exhibition at the Worcester museum where the decade 1930–40 was represented by a carefully selected group of 50 pictures. At the beginning of this period, emphasis was placed on regional painting, the American Scene, but, as the years passed, there was a tendency on the part of artists to be more interested in painting for its own sake without regard for subject matter.

Photography came into prominence when the Museum of Modern Art opened Road to Victory, a superb assembly of 150 photomurals selected by Lieut. Comdr. Edward Steichen, U.S.N.R., and accompanied by a running text specially written by Carl Sandburg. The U.S., its activities and its people were dramatically shown.

Artists for Victory sponsored a huge juried exhibition of painting, sculpture and prints at the Metropolitan museum. Fourteen thousand items were submitted.

At Worcester in 1943, careful research in the early field



of American art resulted in a showing of 55 New England portraits painted prior to the Revolution.

A welcome revival took place at the Brooklyn museum, with a showing of The Eight, the group of New York realists who caused a sensation when they exhibited together in 1908. In the group were Robert Henri, Ernest Lawson, Arthur B. Davies, Everett Shinn, John Sloan, George B. Luks, William Glackens and Maurice Prendergast.

A fine exhibition of the work of Georgia O'Keeffe was a feature in Chicago's Art institute, with the installation effectively carried out by the artist. Sandy Calder, notable as the inventor of "mobiles" and "stabiles" was given a full-length showing at the Museum of Modern Art. His metal constructions, many kept in motion, constituted an entirely new departure in the field of sculpture. The museum also showed two important groups of American painting: Realists and Magic Realists and Romantic Painting in the U.S.

U.S. interest in Latin America, fostered by World War II, was reflected in the Philadelphia museum's showing of Mexican Art Today.

With organizations for world peace coming into prominence in 1944, the Art Institute of Chicago featured Art of the United Nations, composed of one important item from each of 37 nations. This material was most effectively installed in a setting specially designed by Georgy Kepes.

The Cincinnati museum reconstructed, at least in part, the famous Armory show of 1913, which had afforded the U.S. its first view of advance trends in European art. Though the public at large was either terrified or mystified, discerning artists and collectors took note and profited by what was bound to be the trend of the century.

Thomas Eakins, the great 19th century realist, was honoured in his home city, Philadelphia, by a centennial exhibition of major importance. A superbly chosen exhibition of Islamic art was a feature at the Cleveland museum. Exquisite sense of design and colour mark the textiles, ceramics, metalwork and miniatures of the near east, an art less well known than that of China.

Industrial sponsoring of art continued as the Abbott laboratories (one of the first business firms to commission artists) engaged a group of painters, including Joseph Hirsch, Lawrence Beall Smith, Adolf Dehn, to record naval aviation. The results of this project were exhibited throughout the U.S. in one of the most effective war shows.

The Whitney museum, whose galleries had usually been occupied with special exhibitions, arranged a showing of the highlights of their own collection. This served to prove how wisely they had been purchasing in the American field through the years.

In 1945, greater variety appeared in exhibition schedules. French Impressionism came into prominence when the Wildenstein gallery showed the largest group of Monets ever assembled in the United States.

To emphasize the importance of the European artists who had taken refuge in the U.S. during the war, the Whitney museum exhibited the work of those who came after 1938. Max Ernst, Marc Chagall, Fernand Leger, Salvador Dali, Jean Hélion, and Pavel Tchelitchew were among the notables included.

Also at the Whitney was a one-man showing of the New England 18th century portraitist Ralph Earl. His portrait of Roger Sherman was one of the finest characterizations in the annals of early American painting. Organized at the Art Institute of Chicago and later shown at the Whitney was the first large revival of the Hudson River school. Romantic landscape painting in America from 1800 to 1875 made a delightful and highly appreciated assemblage.

Drawings, formerly given scant attention, came into greater prominence as the National Academy of Design started a drawing annual and the Los Angeles museum began a drawing biennial.

Business sponsorship increased. The Encyclopædia Britannica collection was given its first showing at the Art Institute of Chicago before going on a national tour. Upjohn, the pharmaceutical house, assembled an American collection, and Pepsi-Cola for the second time arranged a large juried exhibition with substantial prize money.

More university art departments began assembling collections, as Iowa State followed Arizona and the especially notable precedent set by the University of Nebraska. Annual exhibitions afforded a source from which to make purchases. Four hundred years of landscape painting was a notable feature at the Brooklyn museum.

Postwar Impetus.—During 1946, with the war over and various restrictions removed, exhibitions went on apace. George Bellows was given an impressive revival at the Art Institute of Chicago.

Arts of the South Seas was superbly presented at the Museum of Modern Art and was the most outstanding showing of primitive cultures ever exhibited for their aesthetic qualities. No other art had ever shown greater inventiveness in design and appropriate use of materials.

George Inness, whose popularity had been on the decline, was given a full-scale revival to celebrate the 50th anniversary of the George Walter Vincent Smith Art gallery in Springfield, Mass. With a picture from almost every year of his career, a careful evaluation of his development was possible.

Nostalgia pervaded the atmosphere of New York as Knoedler's, the oldest art firm in town, celebrated its 100th anniversary, while the Metropolitan museum celebrated its 75th birthday with "Taste of the Seventies." In both cases old favourites were brought back as Cabanel, Boucher, Rosa Bonheur and Vibert held sway once more.

Wildenstein showed the most comprehensive group of Gaugins ever assembled. At the Museum of Modern Art, Marc Chagall, the imaginative and colourful Russian-born artist, was given a large retrospective. In Cambridge, the Fogg museum brought out the Pre-Raphaelite pictures from the Winthrop collection and re-evaluated this important English 19th century movement. Watts' "Sir Galahad" and Rossetti's "Blessed Damosel" were among the best remembered in the collection.

Exhibitions to and from England were highlights of the season. Two hundred and thirty American oils and water colours covering the period from the 18th century through the 20th century to date, with emphasis on the contemporary, were sent to London for exhibition at the Tate gallery.

The Art Institute of Chicago was fortunate in being able to negotiate the loan of 63 of the finest Hogarths, Constables and Turners from the king's collection at Windsor, the National gallery, Victoria and Albert museum and the Tate. This collection was the first large group of major pictures ever sent to the U.S. from England. (F. A. Sw.)

Great Britain.—The period 1937–46 was remarkable for a great increase of interest in art, shown most clearly in the attendance at exhibitions of painting. The attendance at the summer exhibitions of the Royal academy alone, which continued throughout World War II, rose from 98,000 in 1939 to 202,000 in 1946; this increase was representative of the larger attendance at galleries of every kind.

In London, the Tate gallery organized an exhibition of the works of John Constable in 1937 on the centenary of his death, and in 1938 the Royal academy held a winter exhibition of 17th century art in Europe of remarkable splendour; among the outstanding works were those of Rembrandt, El Greco, Jan Vermeer, Claude Lorrain and Peter Paul Rubens; this was the last of the series of famous exhibitions at Burlington house, to which masterpieces had been sent from all over the world before World War II. The 1939 winter exhibition was of Scottish art and covered the subject comprehensively from the 17th century to the 20th; a room of portraits by Sir Henry Raeburn was outstanding.

Early in 1940, the National gallery was once more made available for the first of many important exhibitions, "British Painting from Whistler to the Present Day," with 350 canvases. It was followed in November with 100 drawings by Augustus John. A carefully selected exhibition of the work of Walter Sickert in 1941 was complemented by an exhibition of the same artist's pictures at the Leicester galleries. In the same year the Victoria and Albert museum organized an interesting display of the work of Eric Gill, followed by an exhibition to celebrate the tercentenary of the death of Sir Anthony van Dyck. Among the private galleries, Knoedler and Colnaghi held a show of the work of Feliks Topolski. In Jan. 1942 the "Picture of the Month" scheme was started at the National gallery, by now the hub of cultural life in London; it proved immediately popular, averaging more than 20,000 visitors a month with a record attendance of 43,000 to see Sandro Botticelli's "Mars and Venus."

Hertford house was the scene of the first of a number of exhibitions in aid of Allied countries, in this case for Russia, with 900 pictures. Another sign of wartime was the seventh Civil defense artists' show at the Cooling galleries. The National gallery continued to be the scene of important exhibitions: work by Sir William Nicholson and Jack Yeats was shown in January, followed by "Recording Britain," organized by the Pilgrim trust. The principal exhibitions in 1943 were both at the National gallery. The first was a comprehensive one of the work of Wilson Steer and the second was the final show of the "Changing Britain" series organized by the Pilgrim trust.

In London, 1945 was an outstanding year. The National gallery was formally reopened by the king on May 17, with 50 pictures back; the Tate gallery was restricted by bomb damage and continued to be the guest of the National gallery. The Wallace collection reopened in July when Sir Godfrey Kneller's Kit-Kat club portraits were first on view at the National Portrait gallery. At the Leicester galleries the Guedalla collection of the works of Sir Max Beerbohm drew large crowds and the Victoria and Albert museum displayed sculpture removed from Westminster abbey before it was restored. In the autumn began the first of several exhibitions of notable foreign painters: the controversial Pablo Picasso and Henri Matisse exhibition at the Victoria and Albert museum, the Paul Klee exhibition organized by the Tate at the National gallery, and exhibitions of James Ensor, Georges Braque and Georges Rouault followed in 1946. All of these opportunities to see the work of leading modern painters occasioned great interest and stimulating exchanges of views.

In 1946, the collection of English painting belonging to Vincent Massey was on view at the partially repaired Tate gallery before exhibition in Canada. It was followed by a large and important exhibition of U.S. painting from the 18th century at the same gallery where, notable among its re-hung permanent collection, were the Turner and Pre-

Raphaelite rooms. The year ended with the exhibition at Burlington house of the king's pictures, the first time the treasures of the many royal residences had been hung together. The year was also marked by the number and liveliness of the "one man" shows and the scope of the display of old masters at private galleries, among the most important being the Wernher collection at the Wildenstein gallery. Representative exhibitions of the work of living artists from other countries were also organized.

The new interest in pictures was not confined to London; the Cotman centenary exhibition was held at Norwich in 1942, and other important exhibitions during World War II included work by Henry Moore and Graham Sutherland at Temple Newsham, Leeds, and Edward Lear's "Mediterranean Sketches" at Manchester. The *Times* drew attention to the quality of the collection being built up at the Barber Institute of Fine Arts in Birmingham.

The British council organized a considerable number of exhibitions of British art at home and abroad. By the end of World War II, nearly every country had been visited from the U.S.A. to Iceland and from France to Peru.

Continental Europe.—The international exhibition at Paris in 1937 was the occasion of several important exhibitions, including French art in the newly-opened Modern Art gallery and the work of Vincent van Gogh and Catalan art at Maisons-Lafitte.

On the outbreak of World War II all the great galleries and museums of Europe were closed, and many of their works of art were stored in secure hiding-places. Opportunities for holding large exhibitions were rare, although the Palazzo Venezia was used after the liberation of Rome for two exhibitions of masterpieces from the foremost Italian galleries. At the end of the war a number of outstanding exhibitions was held. There was an interesting display of modern tapestry in Paris, from where some of the work of Lurçat was sent to London in 1946. Among Viennese exhibitions was one of the work of Oskar Kokoschka.

(F. C. G.)

Art Galleries and Art Museums

Despite World War II, the decade from 1937 to 1946 was one of tremendous expansion in the museum world, not only in the erection of new buildings but in the acquisition of important collections and individual items.

The most outstanding event of the year 1937 was the offer on the part of Andrew W. Mellon to present his \$19,000,000 art collection to the United States and to build a \$10,000,000 building to house his as well as other great collections which might be offered to a national gallery. Included in the collection were paintings by such world famous artists as Van Eyck, Memling, Rembrandt, Vermeer, Van Dyck, Botticelli, Titian, Raphael, Chardin, Duerer, Velasquez and Goya.

Another notable gesture was made by Jules S. Bache, who offered his collection at 814 Fifth avenue to the state of New York. Particularly notable were paintings by Bellini, Raphael and Peter Christus. In quite a different vein was the establishment by Solomon R. Guggenheim of a Museum of Non-Objective Painting. This collection contained many fine examples of the work of Wassily Kandinsky, although the greatest representation was Rudolf Bauer.

Besides the founding of these three important public collections, several museums acquired paintings of exceptional merit. The Honolulu Academy of Art was too remote to figure often in U.S. news, but its acquisition

of Cézanne's "Girl with Doll" was heralded as an important event. An outstanding Flemish painting, Quentin Massys' "Rest on the Flight into Egypt," was added to the Worcester museum collection. The museum also acquired a celebrated painting by Piero di Cosimo, "The Discovery of Honey," executed in 1498 or soon after.

A notable 18th century French canvas, François Boucher's "Portrait of Mme. Boucher," was purchased for the Frick collection. Dated 1743, this delightful example of the art of an elegant century came from the famous David-Weill collection in Paris.

Thomas Hart Benton completed his murals of Missouri history for the capitol at Jefferson City. Probably no series of murals had ever been the subject of so much controversy.

The Boston Museum of Fine Arts purchased a great Renoir of 1883, "Le Bal à Bougival," sometimes called the "Dance in the Country." Luscious in colour, this full-length canvas shows a spirited young couple dancing gaily at an outdoor resort. The man is Paul Lhote.

The year 1938 was also significant for the increase of art collections available to the public. In Wilmington, the Delaware Art centre opened, featuring the Bancroft collection of Pre-Raphaelites, also a large group of paintings and drawings by the illustrator Howard Pyle.

An important event in museum expansion was the opening of the Cloisters, a branch of the Metropolitan museum, at Fort Tryon park in upper Manhattan. Gift of John D. Rockefeller, Jr., this \$2,500,000 building housed the collection purchased from the sculptor, George Grey Barnard, and the cream of the Metropolitan's mediaeval material. Rockefeller made a notable addition in presenting the six famous Unicorn tapestries.

Fragonard's "Portrait of a Lady with a Dog" and Ingres' grizaille "Odalisque" were the Metropolitan's most notable acquisitions in the field of painting. David's "Portrait of Countess Daru," from the David-Weill collection, was an outstanding addition to the Frick collection. The Rhode Island School of Design purchased "St. Peter's Flight from Prison" by Rembrandt's rare and talented pupil, Carel Fabritius. Picasso's famous painting of 1931, "The Mirror," was presented to the Museum of Modern Art by Mrs. Simon Guggenheim.

In 1939, the Museum of Modern Art moved to its new \$2,000,000 structure at 11 West 53rd street, designed in modern style by Edward Stone and Philip L. Goodwin. Movable partitions afforded flexibility in installation. The rear of the building, largely areas of solid glass, overlooked a sizable court in which sculpture was effectively displayed The museum's tenth anniversary was celebrated at the opening of the new building by "Art in Our Time."

Samuel H. Kress made the first of a series of gifts to the National gallery in Washington consisting of 375 paintings, largely early Italian, and 18 pieces of sculpture. The total valuation was estimated at \$25,000,000. The Museum of Fine Arts in Boston purchased an important painting by the great Venetian, Canaletto, called "The Bacino di San Marco." This came from Castle Howard, one of the great English collections.

Through the Edward Drummond Libbey fund, the Toledo museum acquired one of the best known Renaissance reliefs in existence, the "St. Cecilia" by Desiderio da Settignano. The Cleveland Museum of Art received, as a gift from Louis D. Beaumont, "The Minuet in a Pavilion" by Watteau. This outstanding 18th century French picture was formerly in the collection of Frederick the Great.

In 1940, José Clemente Orozco completed a six-part movable fresco for the Museum of Modern Art. The semi-abstract composition entitled "Dive Bomber and Tank" was designed so that the panels could be arranged in various ways to give different effects.

The most important event of the year 1940 in the museum world was the presentation of the Widener collection to the National gallery in Washington. As it constituted the most important group of works of art still in private hands, this gift on the part of Joseph E. Widener came as a munificent addition to the national collection. Chinese porcelains, furniture, tapestries, jewellery were included, as well as paintings, among which were two notable El Grecos, a "Madonna" and "St Martin and the Beggar," Vermeer's "Woman Weighing Pearls," Raphael's "Small Cowper Madonna," Rembrandt's "Mill."

On March 17, 1941, the National gallery opened formally with the Mellon and Kress pictures forming the nucleus. The Widener collection was not yet in their possession.

For many years the famed Johnson collection was housed in an old residence in downtown Philadelphia. There in a house that was far from fireproof the pictures could not be seen to advantage. It was, therefore, a matter of considerable interest to the art world when the collection was moved to the Philadelphia museum, where it was shown under favourable conditions. The collection did not, however, become the property of the Philadelphia museum, but retained its own identity.

The Museum of Fine Arts, Boston, purchased an enormous painting by Rubens depicting the "Head of Cyrus Brought to Queen Thomyris." Formerly in the collection of the Earl of Harewood, the painting, measuring 80x141 in., was executed in 1622–23.

Perhaps the most noted example in the world of intarsia or wood mosaic inlay is the small library or study, measuring 17x13 ft., which was executed between 1479–82 for Federigo da Montefeltro, duke of Urbino, a small but powerful Italian principality. This room was acquired by the Metropolitan museum from the palace at Urbino and is a unique example of 15th century woodwork Shelves of books, furniture and various small objects were represented so realistically with inlay of various types of wood that one had the illusion that these objects actually existed in the room.

In 1942, the National Academy of Design moved to new quarters at 1083 Fifth avenue, the former residence of Archer M. Huntington. The academy, founded in 1826, had a long and varied history and had included in its numbers the majority of the most notable men in the field of U.S. art. Samuel F. B. Morse, inventor of the telegraph, was the first president and Asher B. Durand succeeded him. "Our Heritage" was the title of a fine retrospective exhibition held as a feature of their opening.

In Terre Haute, Ind., the Swope Art gallery opened and dedicated its activities to the showing of contemporary U.S. art. Of a more sensational nature was the opening by Peggy Guggenheim of the Art of This Century, a gallery at 30 West 57th street, New York, devoted wholly to cubist, abstract and surrealist art. There all the most advanced creations of Dali, Max Ernst and many others could be seen in a setting which was itself unique.

Mrs. Ralph H. Booth presented to the Detroit Institute of Arts one of the most noted of Renaissance portraits, "Eleanor of Toledo" by Bronzino. The most elaborate and





Statue and fountain on the main floor of the National Gallery of Art at Washington, D.C. The gallery was a gift of Andrew Mellon and was dedicated by President Franklin D. Roosevelt on March 17, 1941

sumptuous costume was rendered with meticulous care. The Cleveland Museum of Art came into possession of the John L. Severance collection, one of the most astutely selected groups of furniture and paintings in the U.S., emphasizing the 18th century.

The most outstanding bequest of 1943 was the Grenville L. Winthrop collection which was left to the Fogg museum in Cambridge. Some 4,000 objects constituted this remarkable collection, composed of Chinese bronzes, Egyptian, Aztec and Mayan sculpture, an outstanding group of Pre-Raphaelite paintings and other important

pictures such as David's "Girl in White Dress." Winthrop was a man of extraordinary taste and wide interests.

George Blumenthal bequeathed his collection to the Metropolitan museum, whose president he had been. Paintings and decorative arts of the mediaeval and early Renaissance periods made up most of the collection. A new museum was opened at the Cranbrook Academy of Art at Bloomfield Hills, Mich., demonstrating again the importance of an active museum as an integral part of the art program in U.S. schools and colleges.

In Minneapolis the Walker Art centre was revived and modernized. Formed originally to house the collections of the Walker family, the gallery was reconstructed, all but their finest objects eliminated, and a program organized to emphasize contemporary art. New methods of installation were tried out, and fresh ideas about adult education were put into practice.

A great Veronese, the "Virgin and Child in Glory with Saints," was acquired by the Museum of Fine Arts, Boston. The Cleveland museum purchased a notable early Renoir portrait, "Mlle. Romanie Lacaux," painted in 1864, while the Albright Art gallery in Buffalo acquired "Le Chahut," one of four important oils in the U.S. by the noted French 19th century painter, Georges Seurat.

Three rooms at the Art Institute of Chicago were given over to an outstanding group of 20th century French paintings lent for an indefinite period by Chester Dale, the noted collector of modern art. Picasso, Braque, Modigliani, Matisse and others were shown in first rate examples.

Much activity went on at the Metropolitan museum in 1944, when it did over and reinstalled its galleries as a result of its finest possessions being returned from war storage. As a special precaution, the museum had sent its best material to a place of safety. Paintings were cleaned and reappeared in pristine condition. The Altman collection was moved so that it was placed in proper sequence in the painting gallery arrangement. The Jules Bache collection was turned over to the Metropolitan as it could be housed much more adequately there than in the old Bache mansion.

Thirteen pictures from the Maitland Griggs collection went to the Metropolitan. This exquisite group, for the most part composed of small early Italian pictures, contained such choice panels as the "Chess Players" by Francesco di Giorgio and Sassetta's "Journey of the Magi."

At the time of the famous Armory show of 1913, which was the first exhibition in the U.S. of international modern art of the most advanced sort, the most discussed painting was Marcel Duchamp's "Nude Descending a Staircase." This picture, as well as numerous other cubistic and abstract compositions, was acquired by Walter Arensberg, an astute collector living in Hollywood. His collection grew through the years and gained a just reputation as one of the very top groups of modern works. Arensberg announced that he had given his collection to the Los Angeles branch of the University of California.

Samuel H. Kress made another magnificent gift to the National gallery, 80 paintings and 26 pieces of sculpture. Covering various periods, the group included a Giotto "Madonna," Duccio's "The Calling of the Apostles Peter and Andrew," Sassetta's "The Meeting of St. Anthony and St. Paul," Raphael's "Bindo Altoviti," Tintoretto's "Christ Walking on the Sea" and Watteau's "Italian Comedians." Early Renaissance sculpture formed an important part of the group with such pieces as Verrocchio's "Lorenzo de' Medici" and two busts by Desiderio da Settignano.

In 1945, the Art Institute of Chicago greatly enriched its Kate S. Buckingham collection of mediaeval art with several notable purchases, among which were a "Head of Louis XI of France" (15th century), a 13th century Italian seated "Virgin," and a notable "Head of a Prophet," Ile-de-France mid-13th century.

Chicago also acquired the largest canvas in the U.S. by Chardin, "The White Tablecloth," a simply arranged, deftly painted still life dating from around 1730, and also purchased an imposing late Renoir, a "Seated Nude," of 1919.

A superb re-installation of the Greek collection opened at the Metropolitan museum. This collection, most important in the western hemisphere, now covered the entire history of Greek art from prehistoric times to the late classical and included masterpieces such as a full standing male figure, "Komos," of about 600 B.C., a superb bronze statuette of a horse dating from about 480 B.C., and an "Eros" of the Hellenistic period, 250–150 B.C. Vases, bronzes, jewellery and many other smaller objects were carefully selected and arranged to show the visitor in logical progression the development of Greek art.

The Cleveland museum purchased through the Grace Ramey Rogers fund a fine French portrait of 1795, David's "La Citoyenne Crouzet," showing his neoclassic style at its best. They also acquired "La Vie," a well-known Picasso of the Blue period, done in 1903.

A famous Fragonard drawing, "Les Pétards" (The Firecrackers), went to the Museum of Fine Arts, Boston. The Detroit Institute of Arts acquired an outstanding Flemish portrait, Mabuse's "Johann Ingenary, Abbot of the Monastery of Camp," dated 1535. A realistic portrait by Thomas Eakins, Mrs. Mary Hallock Greenewalt, was added to the collection at the Wichita (Kan.) Art museum.

A richly painted late Renoir, "The Young Shepherd," entered the Rhode Island School of Design in Providence. Painted in 1911 when the artist was over 70, it probably shows Alexander Thurneyssen, the younger son of a Munich doctor whom Renoir had recently visited. The Frick collection reopened with new hanging and many pictures freshly cleaned. Again the public was able to enjoy this splendid collection, well chosen by Henry Clay Frick.

The year 1946 closed a decade with continued munificence of gifts to museums and the announcements of future rebuilding and expansion. Samuel H. Kress for the third time became a great benefactor of the National gallery in Washington, presenting on this occasion 110 works of art. Among the paintings were Fra Angelico's exquisite "Healing of Donna Palladia by St. Cosmos and St. Damian," two Sassettas, two Botticellis, two Fra Filippo Lippis, three Bouchers, three Fragonards, Ingres, Chardin's wonderful "Portrait of an Old Woman." The famous "Capitoline Wolf," a Sienese 15th century bronze, was also part of the group.

After ten years of litigation, the Ringling museum at Sarasota was turned over to the state of Florida. With this went the home of the circus magnate, John Ringling, destined to be a Venetian museum. The two properties were reputed to be worth \$15,000,000.

A Duccio "Crucifixion," comparatively little known item in the J. P. Morgan collection, was added to Boston's Museum of Fine Arts.

At the Art Institute of Chicago an impressive array of some 60 drawings, nearly all later gifts and purchases, was opened in a specially designed setting. Highlights in the group were Canaletto's "Ruins of a Courtyard"

and Fragonard's "The Letter." Degas, Gauguin, Cézanne, Van Gogh, Picasso and numerous others were included in top quality examples.

Disposition of European art objects was a matter of great interest. More than 6,000 objects looted from France by the nazis were returned to the Rothschild and other collections. Paintings, sculpture, tapestries, silver and many other sorts of art objects from French collections were discovered in Schloss Neuschwanstein, built by mad King Ludwig II of Bavaria, at Fussen near Munich.

Two hundred and two paintings which formerly hung in German museums arrived at the National gallery in Washington for safe keeping until such time as conditions in Germany should warrant their return. The group, which included pictures by Fra Angelico, Botticelli, Duerer, Chardin, Holbein, Hals, Rubens, Rembrandt, Vermeer and Velazquez, was valued at \$80,000,000.

Museums throughout the U.S. contemplated building new wings and expanding in various ways as soon as building material became available. Elaborate plans were announced by the Metropolitan museum, which was working on a \$10,000,000 reconstruction project. The museum planned to divide its collections into five separate units: American art, oriental art, decorative arts, ancient art and a picture gallery. A special Whitney wing was to be constructed to house the Whitney Museum of American Art. In this way order and logic would be brought to a collection which had become too vast and unwieldy for its quarters. (F. A. Sw.)

Arthritis

Rheumatic disease, a general term including various forms of arthritis, is responsible for an appalling amount of invalidism. It was estimated that more than 320,000 persons in the United States alone were rendered unemployable for an entire year by these disorders. About one in each 1,000 persons in the U.S. was affected with some form of rheumatism on any one given day.

The greatest advance in the understanding of arthritis during the decade 1937-46 came from the recognition and differentiation of several types. A formal step in this direction was taken by the American Rheumatism association at its June 1941 meeting in the adoption of provisional classification: (1) specific infectious arthritis, where the causative organism is known; (2) arthritis of rheumatic fever; (3) rheumatoid arthritis (also called atrophic or chronic nonspecific infectious arthritis); (4) degenerative joint disease (also called osteoarthritis or hypertrophic arthritis); (5) arthritis of immediate traumatic origin; (6) arthritis of gout; (7) arthritis of neuropathic (nerve disease) origin; (8) neoplasms (tumours) of joints; and (9) miscellaneous forms (or arthritis associated with other disease). The developments of the decade can be best considered under the headings suggested.

Specific Infectious Arthritis.—The treatment of several of the types of arthritis falling in this group was revolutionized. Included are arthritis caused by the tubercle bacillus, the pneumococcus, gonococcus and streptococcus, called respectively, tuberculous arthritis, pneumococcal arthritis, gonorrhoeal arthritis and suppurative arthritis.

The treatment of tuberculous arthritis was not extensively modified. All three of the other varieties mentioned, however, were found to yield to treatment with the sulfonamide drugs or penicillin, or both. In fact, the results of treatment were little short of miraculous in most cases.

Consequently, the importance of early and accurate identification of the germ responsible for the arthritis of any of these varieties became even more important than in the past.

Another member of this group is the arthritis which frequently accompanies undulant fever or brucellosis. Brucellosis, caused by a specific germ and often associated with painful and inflamed joints, became increasingly widespread during the decade. The treatment for the arthritis of undulant fever was not always satisfactory; good results were reported from the use of a serum, a vaccine, and chemical agents of the sulfonamide group. Penicillin proved disappointing.

There are other types of joint disease caused by identified microbes, but those mentioned are the most common. Some of these other varieties also responded to treatment with the sulfonamides or penicillin.

Arthritis of Rheumatic Fever.—Painful and swollen joints usually accompany the disease called rheumatic fever. The cause of rheumatic fever still was not known, although it was the subject of extensive research, especially in the U.S. armed forces. The joint symptoms associated with the disease are usually severe, and the joints are swollen and painful, though permanent damage to them is rare. No specific treatment for rheumatic fever arthritis was developed; the use of salicylates (of which aspirin is the best known example) internally, and oil of wintergreen (another salicylate) externally was still the most favoured form of treatment.

Rheumatic fever and its joint symptoms tend to recur. Both the arthritis and the other symptoms often can be prevented from coming back by taking one of the sulfonamide preparations (usually sulfathiazole) by mouth over a long period. This did not seem to affect the arthritis directly but acted to cut down the number of infections of the throat causing a recurrence of the disease.

Observations made by the U.S. navy and army air forces in particular showed that rheumatic fever was much more common in certain localities than in others. During World War II it was decidedly worse in air force installations in the Rocky Mountain area than it was, for example, in southern camps. The reasons for this were not yet clear at the end of the decade.

Rheumatoid Arthritis.—Rheumatoid or atrophic arthritis is the variety of joint disease responsible for most cases of arthritis deformity and crippling. It is extremely widespread and accounts for a high percentage of all cases of rheumatic disease.

The cause of rheumatoid arthritis had not yet been discovered in 1946. It has many of the aspects of an infectious disease, but no germ or virus had been discovered which investigators could agree on as a definite cause. One of the greatest difficulties in investigating it was the fact that animals do not have any natural disease sufficiently similar to rheumatoid arthritis in human beings to serve as a real aid. Probably the closest approach to rheumatoid arthritis in animals is a spontaneous infectious polyarthritis in the rats of Java, which before World War II offered promise of yielding information of practical importance. Progressive arthritis resembling in certain respects human rheumatoid arthritis was produced experimentally in mice, who were given a viruslike microorganism obtained originally from a brain of a normal mouse. In both cases, however, later studies did not throw any new light of importance on the disease in human beings.

Although the causes of rheumatoid arthritis were not discovered, a great many interesting observations were made which eventually might help in solving the problems. It was noticed, for example, that patients with rheumatoid arthritis who became jaundiced are usually relieved of their joint symptoms for a period of time. Attempts were made to inject the bile salts causing jaundice into the patients with rheumatoid arthritis with the purpose of trying to alleviate their symptoms. This treatment was only moderately successful. It was found that when jaundice could be produced by this means the joints were usually improved, but the improvement did not generally outlast the jaundice very long.

Patients with rheumatoid arthritis in one group were found to have blood vessels which could be particularly easily constricted-this meant that the circulation in certain areas could be interfered with more easily than in normal persons. This observation suggested the reason why some persons may be particularly predisposed to rheumatoid arthritis or to flare-ups of the condition after they have had an emotional upset or have been exposed to cold. In another study several women with typical rheumatoid arthritis were placed under conditions which caused them to lose body water. The water loss caused a decrease in the joint pains and swellings, and the patients demonstrated an increased ability to move easily. When the process was reversed and the patients accumulated body water, the symptoms got worse. Emotional stress was known to effect the onset and course of arthritis in many patients. When the skin temperatures of a group of patients were recorded, emotional stress was found to produce a drop in skin temperature of just about the same degree in normal as in arthritis persons. This indicated that further study of the problem was necessary.

Increasing recognition was given to the fact that rheumatoid arthritis is a disease of the body as a whole rather than of the joints alone. With this came greater emphasis on treating the whole patient rather than just the joints. The sulfonamide drugs and penicillin were tried but did not prove at all effective. During the decade, treatment with gold salts by injection received a great deal of study. The evidence indicated that gold salts are effective in a good many people and bring about considerable relief of symptoms. Unfortunately, however, the salts are toxic and dangerous, and severe reactions were observed. Until less dangerous gold salts than those on the market were developed, this form of treatment probably would not be widely used. A synthetic drug known as neostigmine was tried in rheumatoid arthritis as well as in a variety of other diseases involving spasm, tension and spasticity of the muscles. This drug was reported as having value in relieving the muscular tension and some of the pain connected with rheumatoid arthritis, but it did not act on the inflamed joints themselves.

Increasing recognition was given to the need for adequate institutional care for patients with chronic arthritis, especially of the rheumatoid variety. In Sweden, for example, state pensions were granted workers for permanent incapacity caused by chronic articular rheumatism. In the U.S. the need for institutions for chronic invalids and for the establishment of a dispensary organization for rheumatic patients was stressed.

Degenerative Joint Disease.—Although degenerative joint disease often goes by the name of osteoarthritis or hypertrophic arthritis, true inflammation in the joint is usually absent. Investigations showed that prolonged injury to or excessive use of the joints is likely to result in some enlargement of the bone around the joint which is

the principal characteristic of this disorder. A study of cattle, for example, indicated that degenerative changes of the bone were much more common in those joints which received excessive use and minor injury than in those joints not used so hard. The enlargement of the end joint of the little finger commonly seen in baseball players and caused by repeated injury, is almost exactly similar to the ordinary forms of degenerative joint disease. Consequently, during the decade, the part played by chronic injury, whether by ordinary use or special damage, came to be recognized as an important if not the most important cause. When inflammation of the joint does develop, it is more commonly caused by irritation of the joint membranes from the enlarged bone rather than by any bacterial or infectious process, such as is present in true arthritis.

Little was discovered about treatment of degenerative joint disease. If the theory as to its origin was not disproved, the treatment would be likely to consist in prevention of further injury, so far as possible. It was unlikely that any method would be found soon of dissolving the excess bone formation without injuring the normal bone structure.

Arthritis of Immediate Traumatic Origin.—Traumatic joint disease occurs most frequently as a result of injury from athletic sports; about half the cases come from strains of the ligaments and the remainder from bruises to the joints, muscles or bursas, or damage to the cartilages lying deep in the joint itself. Treatment of the strains and bruises is aimed at decreasing the amount of bleeding. Early application of ice water to the injured part, followed by a sponge rubber type bandage and rest was suggested. Later treatment consisted of heat, gentle massage and early mild exercise with the joint supported by a compression bandage. For the cure of deep injuries, the most common of which is "internal derangement of knee joint," operation was usually necessary.

Arthritis of Gout.—Gout is a disease which, if it continues for a long time, may cause chronic inflammation in a joint or joints. During the decade there were many articles on the subject which indicated that gout is not as rare as generally believed. Consequently, it may be a more important cause of arthritis than is usually recognized. There were no outstanding discoveries on the cause or treatment of gout during the decade, but its recognition as a cause of joint trouble seemed to be important.

Arthritis of Neuropathic Origin, Neoplasms and Miscellaneous Forms.—Certain diseases affecting the nervous system result in changes in the joints; such changes are called neuropathic arthritis. Inflammation may or may not be present, but occasionally the joint changes are remarkable in size and extent. The treatment is, of course, directed at the cause when the latter can be identified. As a rule, however, the changes which have developed in the joints are irreversible.

Neoplasms or tumours of the joints are rather rare, but do occur. What they cause in the joints should not properly be called arthritis, although secondary inflammation is sometimes present. The treatment is directed at the tumour and includes surgery, X-ray or radium.

There are a considerable number of diseases or miscellaneous conditions which can cause joint disturbance. This group includes some joint diseases of unknown cause, as well as the joint symptoms which accompany well known disease entities. Among the most interesting joint disorders in this group is a disease which has been called palindromic rheumatism, a recognized oft-recurring disease of the joints. The outstanding features of this condition

are repeated attacks of acute arthritis involving several joints not accompanied with fever. The joints become painful, swollen and red. The attacks develop rapidly, last only a few hours or days, and then disappear completely, only to come back again and again at irregularly spaced intervals. In spite of the acute inflammation in the joints, the condition does not seem to harm the joints permanently, and abnormalities cannot be discovered even after hundreds of attacks.

Another important joint disorder of rather uncertain classification is a condition of the joints of the spine, called spondylitis. Some felt during the decade that this is really only one variety of rheumatoid arthritis, but the point was not settled. It is a condition affecting men—usually young men—much more frequently than women—the reverse of the usual type of rheumatoid arthritis. It is a gradually progressing disease often called "poker spine." The cause of this disease also had not been discovered during the decade, and little was known as to its genesis. Some studies indicated that X-ray treatment is the most effective. Although X-ray treatment does not always bring relief, it was probably the most important development of the period in the treatment of spondylitis.

* * *

THE TYPE of arthritis which most needed investigation at the end of the decade was the rheumatoid. The cause of rheumatoid arthritis was yet to be discovered; an experimental animal which could be used satisfactorily to increase the knowledge about this disease had not been found. Also, no sure cure for rheumatoid arthritis was yet available. In spite of failure to solve all the problems of arthritis during the decade, however, great progress was made. The principal feature of this progress was the division of arthritis into more clear-cut groups, some of which could be promptly and successfully treated. Also important was the recognition of degenerative joint disease as caused principally by use and injury rather than inflammation. Treatment of certain varieties of arthritis of known cause with the sulfonamide drugs and with penicillin represented a great advance. The use of gold salts, especially if non-toxic preparations could be developed, offered considerable hope for the treatment of patients with rheumatoid arthritis. The X-ray treatment of arthritis of the spine, or spondylitis was also a promising new method of treatment.

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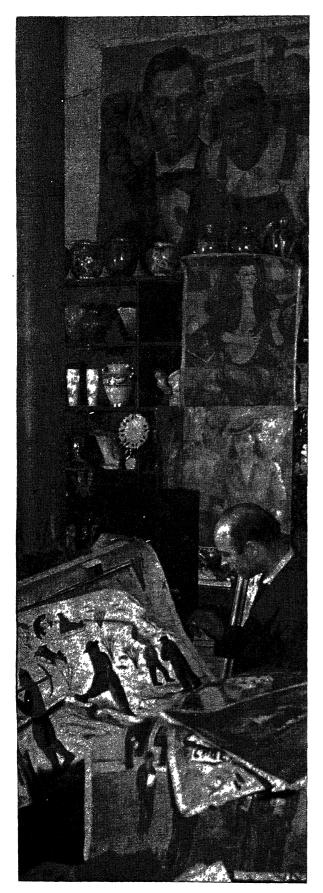
See VEGETABLES.

Artificial Silk

See RAYON AND OTHER SYNTHETIC FIBRES.

Artillery

See Munitions of War; Tactics of World War II; World War II.



Art Institute of Chicago

See Ari Galleries and Art Museums.

Art Sales

The sales rooms of art saw a spectacular increase in their business, unequalled in their history, during the decade 1937-46. A basic reason could be found in the fact that within that period the United States went from a major depression, with its accompanying shortage of cash and lower prices, to a major world war, with the resulting large incomes and high prices. Many secondary factors had also to be taken into consideration. With the great increase in inheritance taxes, many collections were sold, since heirs preferred to take advantage of high prices rather than be subject to high taxes. As automobiles and many luxury goods went off the market and travel was restricted, those in comfortable income brackets looking for a place to spend their money found the auction rooms enticing. High prices were no deterrent, since there was always the prospect that they were going still higher.

The presence of many discriminating collectors from Europe also stimulated competition in the salesroom. Accustomed to the drastic fluctuation of currency in Europe, they knew even better than Americans that a fine work of art was a good investment. Throughout the country there was a rising interest in art; more and more people developed discriminating taste; they went to the auction rooms in ever-increasing numbers and with greater understanding of what they were buying. Anything of quality inevitably brought a good price. Auction statistics, announced every summer, covered the previous season rather than the calendar year. In 1937, the leading New York auction house was the American Art Association-Anderson galleries, which did an unusually good business in the 1936-37 season because of the Brady sale. Their total amounted to \$2,970,997, of which \$471,761 came from the sale of the 86 room Long Island mansion, Inisfada, and contents, property of Mrs. Nicholas F. Brady (Mrs. William J. Babington Macaulay). Two Tournai tapestries brought \$43,000.

The Parke-Bernet galleries were organized in Jan. 1938, and in their first season did a \$1,250,000 business. Total for the American Art Association-Anderson galleries was \$2,000,000, of which \$535,220 represented the sale of the Cortland F. Bishop library. This was their last season and the following year they were succeeded by Parke-Bernet as the leading auctioneers. The Plaza auction rooms, a smaller firm, continued to operate, doing a business of \$681,701 in 1938.

Auction trends after 1938 could best be followed through the statistics of Parke-Bernet, which in 1939 showed a total of \$2,417,330. Their two largest items were a portion of the William Randolph Hearst collection which brought \$393,796.50 and the John A. Spoor library, \$181,510. Their 1940 season was about the same, \$2,329,330.50 with Mrs. Cornelius J. Sullivan's sale as the highlight. Van Gogh's "Mlle. Ravoux" brought \$19,000.

By 1941 the rise in prices was beginning to be felt. Parke-Bernet totalled \$3,606,881.75, the largest amount after 1929. Mrs. Henry Walters' sale came to \$646,684,

WPA art project paintings were sold for a few dollars each at a secondhand shop in New York city in 1944. Purchased from a government warehouse for four cents a pound after the liquidation of the project, they represented the work of numerous artists during the depression years

and in the J. Horace Harding sale were several notable paintings including Goya's "Victor Guye" at \$34,000.

By 1942 Parke-Bernet totalled \$4,007,823, their highest single item having been \$39,000, paid for John Hoppner's portrait of Miss Frances Beresford. Gimbel's department store had taken advantage of the lucrative art market and through their auctioneers, Kende, amassed \$5,255,000. A good portion of this came from the sales of the Bliss collection and Clarence Mackay collection. Late in the year Kende took over the old Jay Gould mansion on Fifth avenue as a centre in which to hold their auctions.

The 1943 season was slightly less but still far above the average. Parke-Bernet totalled \$3,611,847. Highest single sale was the Mr. and Mrs. Charles E. F. McCann collection which amounted to \$266,207, and included furniture, ceramics and silver. A gold tea service which had belonged to Paul I of Russia brought \$11,000. The Wadsworth Lewis sale was second at \$187,238. Individual pictures brought good prices, Renoir's "Fleur et Chats," \$34,000, and Frans Hals's "The Rev. Caspar Siblius," \$30,000. Kende gallery, including floor sales at Gimbel's, totalled \$4,225,000. A Cuyp landscape brought \$8,700 and a Rosa Bonheur \$7,600.

A great rise was noted in 1944, the first year of the great art boom. Parke-Bernet's total reached \$6,156,632.50. Kende's, including the Hearst sales at Gimbel's, brought \$4,100,000, and the Plaza auction galleries, \$1,196,812.70. This made a total of nearly \$11,500,000. Parke-Bernet alone had an attendance of just under 200,000. The stock of Yamanaka brought \$466,971.50, the J. P. Morgan sale, \$400,540, John R. Thompson sale, \$262,780. In the last was Frans Hals's "The Merry Lute Player," which brought the top price of the season, \$127,000. Corot's "La Grande Métaire" brought \$20,000, Manet's "Le Petit Lange," \$18,500, and furniture, with \$4,200 for a pair of Chippendale chairs, was also at a new high.

The art market continued to flourish during 1945. Parke-Bernet reached \$6,165,920.50 and Kende \$3,635,275. At Parke-Bernet, the William H. and Cornelius Vanderbilt sale totalled \$323,195 and indicated the renewed interest in the Barbizon school and other 19th century painters long out of favour. Millet's "Water Carrier" tied with a Fra Filippo Lippi "Madonna" for \$30,000. Millet's "The Sower" was bought for \$26.000 by the Provident Trust company, since it was the original of their trademark. A Boldini went for \$6,000 and a Gerome for \$5,700. Kende's top sale was Tintoretto's "The Baptism of Clorinda" at \$41,000. Frederic Remington's "A Dash for Timber" brought the astounding price of \$23,000.

Parke-Bernet's 1946 record made auction history with an all-time high of \$6,684,045. The Isabel Van Wie Willys collection brought \$594,902. A portion of the collection of the late Sir William Van Horne, Canadian railroad magnate, went for \$221,500. A notable library of early English books, belonging to Frank J. Hogan, brought \$209,888. The Marion Davies and Walter P. Chrysler, Jr., collection's were others fetching high totals. The highest individual price was \$75,000 paid by Billy Rose for Rembrandt's "Pilgrim at Prayer." Toulouse-Lautrec's "Gueule de Bois" brought \$30,000, and Ryder's "Siegfried and the Rhine Maidens," \$23,500. Popularity of genre painting was indicated by the fact that Fortuny's "Breakfast at the Alhambra" went for \$5,200.

The Plaza galleries, always on a more modest scale, totalled \$1,441,471.95 with \$7,200 for Greuze's "Portrait of a Child" their top single price. Kende sold Sorolla's "Andalusian Dancers" for \$4,700, another return to popularity of an artist out of favour. (F. A. Sw.)

Arts and Sciences, American Academy of

See Societies and Associations.

Aruba

See Curação.

Asbestos

The asbestos production of the major producing countries, so far as data were available at the end of the decade 1937–46, is shown in the accompanying table.

Wor'd Production of Asbestos (Thousands of short tons)

193 <i>7</i>	1938	1939	1940	1941	1942	1943	1944	1945
Canada 410.0	289.9	364.5	345.8	477.8	439.5	467.2	419.3	460.1
Cyprus (exp.) 13.1	6.2	11.4	10.7	5.4	3.9	1.4		
Italy 7.0		7.5	9.1	11.9	12.9			
South Africa 28.6	23.2	22.1	27.4	28.3	34.6	35.6	34.6	21.8
South Rhodesia 57.0	58.8	58.3	57.9	54.2	62.3	56.4	58.3	56.3
Swaziland		8.0	20.8	21.1	25.6	18.9	32.7	
United States 13.9	12.9	15.1	19.2	22.4	15.3	3.9	7.6	13.6

Data were too incomplete to permit the accumulations of world totals during the war years, but the total was of the order of 675,000 short tons in 1937. Except for the soviet union, with an output estimated at 138,000 tons in 1937, production from countries not listed was small. Lacking world totals, the trend in output could be judged only from the totals of the major producers, as listed in the table. War demand offset the 25% drop caused by the 1938 business recession, but it was not until 1941 that the 1937 level was passed, but then by a margin of 18%. Subsequent years brought declines, but 1945 rose to the 1941 level.

The Canadian output was irregular, with alternations of high and low figures each year after 1937, and after 1941 each high or low was less than the one preceding, marking a definite downward trend. However, in the first half of 1946, production was 250,217 tons as compared with 460,051 tons in 1945 and the previous record high of 477,846 tons in 1941. Although the bulk of the Canadian output continued to be exported, domestic consumption in the production of asbestos products had more than doubled after 1937.

In Southern Rhodesia, production fluctuated little, with the greatest activity in 1942. War demand for the special grades found only in South Africa kept output increasing until 1943, with a minor decrease in 1944; however, the 1945 production dropped to less than that of 1938 and 1939. Although Swaziland first appeared in the list as a new producer in 1939, with 7,973 tons, output increased consistently, and in 1944 was only a trifle less than in South Africa.

Italian production was stimulated by war demand up to 1942; later data were lacking, but the industry probably suffered when the fighting reached Italian soil. Production in Cyprus gradually waned, and considering the conditions prevailing in the Eastern Mediterranean during these years, it was surprising that mining could continue as long as it did.

The United States remained the largest consumer of asbestos, but had never had a significant output. Production nearly doubled under war demand, to a high of 22,396 tons in 1941, and after a sharp decline in 1942 and 1943, came back to the 1939 level in 1945.

The relatively small domestic output of the U.S. furnished only a small fraction of the consumption demand, most of which was supplied by imports—chiefly from Canada, South Africa and Rhodesia. Imports rose from

307,188 tons in 1937 to a high of 419,242 tons in 1942, and declined to 374,199 tons in 1945.

Aside from the acceleration in demand for asbestos in its ordinary applications (brake linings, pipe insulation, building materials, etc.) there were a number of more specific military uses. Long fibered Rhodesian chrysotile, low in iron, was required for woven electrical insulation for naval and aircraft use. South African amosite was used in heat insulation of low weight per cubic foot, and South African crocidolite, or blue asbestos, used in fabricating asbestos-cement pipe, made more iron available for war uses.

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ASCAP (American Society of Composers, Authors and Publishers)

See Music, Societies and Associations.

Ascension

See British West Africa.

Asia

See Afghanistan, China; India; etc.

Asparagus

See VEGETABLES.

Asphalt

The production of natural and manufactured asphalts in the United States during 1937-45 is shown in the table.

Under normal conditions paving had taken most of the bituminous rock, petroleum asphalt and road oil, with roofing the second largest consumer of petroleum asphalt. During the early years of World War II much of the paving demand was restricted to divert the materials into airport runways. Normally imports of all types of asphaltic materials were around 100,000 tons a year, while exports

U. S. Production of Asphalt, 1937-45

	Natur (Thousands of		Manufactured (Barrels)			
	Bituminous Rock	Gilsonite	Petroleum Asphalt	Road Oil		
1937	447.213	38,038	4.181.988	8,087,231		
1938	449.091	28,574	4,506,900	7.788.000		
1939	422,484	37,289	4.954.200	7,868,000		
1940	458,665	31,930	5,346,700	7,769,000		
1941	654,692	36,407	6.557.600	9,149,000		
1942	935,295	40,041	6.296.500	8,039,000		
1943	835,648	50,446	6.756.700	2.295.000		
1944	740,454	49,051	6.996.100	1,556,000		
1945	642,600	61,273	7,126,600	5		

were more than double that figure. During World War II the figures were approximately reversed.

BIBLIOGRAPHY.—H. Abraham, Asphalts and Allied Substances (1945); National Asphalt Conference, Proceedings 1937–1940 (1940); U.S. Bureau of Mines, Minerals Yearbook. Periodical Mineral Industry. (G. A. Ro.)

Assassinations

Following is a list of the principal actual and alleged assassinations of the years 1937–46 inclusive:

Ananda Mahidol, king of Siam, found shot in the royal palace at Bangkok on June 9, 1946; an investigation board later pronounced his death as probable assassination.

Andrews, Lewis Yelland, district commissioner of Galilee; shot fatally with his bodyguard, Constable Peter R. McEwan, at Nazareth, Palestine, on Sept. 26, 1937.

Barthélemy, Georges, former French Socialist deputy

who later became one of Pierre Laval's chief henchmen in the Vichy government; according to the Germancontrolled Paris radio, he was assassinated by "terrorists" in Paris on July 10, 1944.

Boris III (q.v.), king of Bulgaria, who died after a brief illness Aug. 28, 1943, at Sofia. The official statement attributed his death to a heart attack, but it was widely rumoured that he had been assassinated.

Calinescu, Armand, Rumanian premier; slain by six members of the fascist Iron Guard at Bucharest on Sept. 21, 1939. Hundreds of Iron Guardists were executed or imprisoned in reprisal.

Chang, Samuel H., director of the U.S.-owned Post Mercury company and two Chinese newspapers; assassinated by a gunman in the International zone, Shanghai, on July 19, 1940.

Darlan, Jean (q.v.), French naval officer, politician and vice-premier of the Vichy government before his political agreement with the Allies following the North African invasion of Nov. 1942; he was shot and killed by a young Frenchman in Algiers on Dec. 24, 1942.

Dormoy, Marx, French Socialist leader and interior minister in the Popular Front cabinet of Léon Blum; killed in explosion of time bomb set in his room by unknown persons near Montelimar, France, on July 26, 1941.

Fu Hsiao-en, Japan's puppet mayor of Shanghai; assassinated while asleep in his home on Oct. 11, 1940.

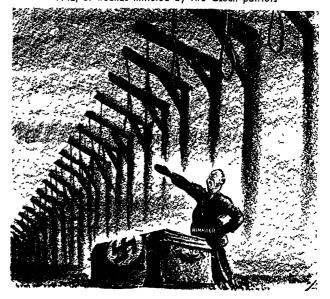
Haidar, Seyyid Rustum, Iraqi minister of finance; shot by a dismissed police inspector on Jan. 18, 1940, at Baghdad, Iraq, and died of his wounds four days later.

Henriot, Philippe (q.v.), French fascist and minister of propaganda in the Vichy government; shot and killed by French patriots disguised as policemen, in his home at Paris on June 28, 1944.

Heydrich, Reinhard (q.v.), called "The Hangman," German reich's protector for Bohemia and Moravia; he was shot by two gunmen while riding in his automobile on the Prague-Berlin highway on May 27, 1942, and died in Prague on June 4. In retaliation, the Germans slew many Czechs and razed the village of Lidice, where the assassins were suspected of having taken refuge.

Janeff, Sotir, pro-nazi president of the Bulgarian parlia-

Biting retort by Lewis in the Milwaukee Journal, to Heinrich Himmler's elegy of Reinhard Heydrich as a "character of rare beauty." Heydrich, known throughout Europe as "the hangman" died June 4, 1942, of wounds inflicted by two Czech patriots





Leon Trotsky on his deathbed in a Mexico City hospital Aug. 21, 1940. His assassin, according to Trotsky's associates, was an agent of the Russian O.G.P.U.

ment's foreign affairs commission, editor of the semiofficial *Slovo* and adviser to King Boris III; killed by two gunmen in Sofia on April 15, 1943.

Jorga, Nicolas, former premier of Rumania; slain by Iron Guardists in Bucharest on Nov. 28, 1940.

Maher Pasha, Ahmed, Egyptian premier; shot and killed shortly after he had read a royal decree declaring war on Germany and Japan, in the parliament building at Cairo on Feb. 24, 1945.

Marriner, James Theodore, U.S. consul at Beirut, Syria; slain by a crazed Armenian in Beirut on Oct. 12, 1937.

Moffatt, W. S., British assistant district commissioner; slain by an Arab gunman in Jerusalem on Aug. 25, 1938.

Monck-Mason, George E., British consul at Mosul, Iraq; slain by mob at Mosul on April 4, 1939, after rumor that King Ghazi, killed in a motor accident, had been slain by the British.

Moyne, Lord, British resident minister for the middle east; shot by two Jewish Palestinian terrorists, in Cairo, Egypt, on Nov. 6, 1944.

O'Dwyer, Sir Michael, retired British administrator in India; shot fatally by an East Indian at a public meeting in London, on March 13, 1940. The assassin also wounded Lord Zetland, secretary of state for India, and Sir Louis Dane and Lord Lamington, both former British administrators in India.

Osman Pasha, Sir Amin, former Egyptian finance minister; killed by a gunman in Cairo on Jan. 5, 1946.

Paringaux, Yves, French chief of staff of the Vichy government's interior ministry who directed suppression of anti-nazi activities; his body was found on a railroad track at Melun, France, on Jan. 5, 1942.

Peyeff, Yordan, Bulgarian army chief of staff; shot and killed by a Macedonian terrorist who then committed suicide, at Sofia on Oct. 9, 1938.

Rath, Ernst vom, third secretary of the German embassy in Paris; shot in the embassy on Nov. 7, 1938, by Herschel Grynszpan, a young Polish Jew, and died two days later in Paris. His assassination was followed by a renewed outburst of anti-Semitism in Germany.

Sidqi Pasha, Baqir, dictator of Iraq, assassinated by a

soldier in Baghdad on Aug. 12, 1937. Also slain was Major Mohammed Ali Jawdat, commander of the Iraqi air force.

Tang Shao-yı, first premier of the Chinese republic; assassinated in Shanghai on Sept. 30, 1938.

Tcheng Loh (Ch'en Lu), foreign minister in the Japanese puppet government at Nanking; shot fatally by some 20 Chinese assailants in Shanghai on Feb. 20, 1939.

Tresca, Carlo, anti-fascist leader and editor of an Italianlanguage weekly in New York city; shot and killed as he was leaving his New York office, on Jan. 11, 1943.

Trotsky, Leon (q.v.) (Lev Davidovich), Russian politician who fled the soviet union and ultimately took refuge in Mexico; attacked fatally by a man whom he described as an agent of the Russian secret police, in Mexico City, on Aug. 20, 1940. Trotsky died of his wounds the next day. The assassin gave his name as Frank Jackson but was identified as Jacques Monard van den Dresched.

Villarroel, Gualberto, president of Bolivia; killed by Bolivian student revolutionaries, at La Paz, on July 21, 1946. He was shot after being hurled from a balcony of the presidential palace; his body was then hung from a lamp post in an adjacent plaza.

Associations

See Societies and Associations.

Asthma

See Allergy.

ASTP (Army Specialized Training Program)

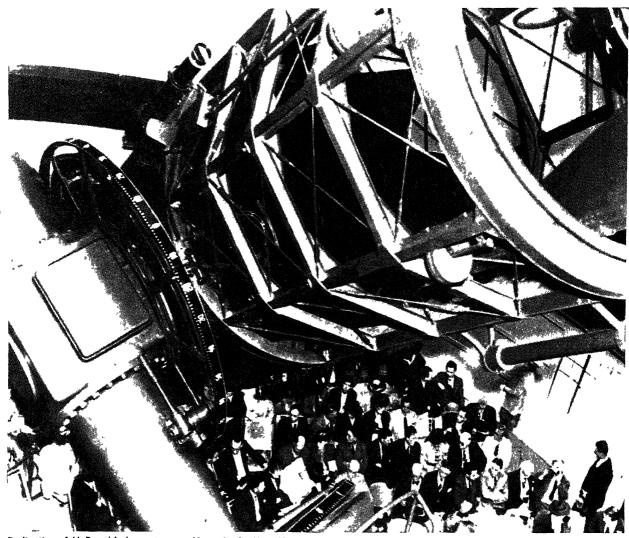
See EDUCATION.

Astronomy

The establishment of a new observatory, always an event of interest to astronomy, is of particular interest when two great universities combine their resources to establish one of the foremost observatories of the world. The dedication of the McDonald observatory in May 1939, celebrated the successful result of such a co-operative effort. Located in northwestern Texas, the McDonald observatory was built by the University of Texas and staffed by the University of Chicago. The 82-inch reflecting telescope, with numerous improvements in design and operation, was attested by experts to be one of the finest ever constructed. An idea of the superb quality of this great telescope was supplied by the fact that the distinguished double star observer, Georges Van Biesbroek, was able to measure successfully the separation of some of the closest visual double stars with it. The announcement of this feat occasioned surprise among astronomers, since it had been thought that large reflectors were poor instruments to use for this exacting type of visual observation.

Two other important new observatories were established during the decade 1937–46. Mexico's new astrophysical observatory at Tonanzintla was dedicated in Feb. 1942, equipped with a 27-31-inch Schmidt telescope and favourably situated for observations of the southern sky. The new astrophysical observatory of Haute-Provence in southern France was placed in operation during 1945, equipped with a 47-inch telescope and auxiliary instruments for investigations in the field of stellar and nebular spectroscopy.

Successful development of the Schmidt telescope as a powerful tool in astronomical research was shown by the installation of three telescopes of this type in the United



Dedication of McDonald observatory, on Mount Locke, Tex., May 5, 1939, with 400 distinguished guests attending

States (at Mt. Palomar, Calif., Harvard, Cambridge, Mass. and Case School of Applied Science, Cleveland, Ohio) as well as the excellent instrument at Tonanzintla. These telescopes made use of a spherical mirror and correcting plate instead of the usual parabolic mirror, and gave a wide-angle field in good focus. Their high speed was indicated by the fact that a good picture of a comet could be obtained in such a short time that the star images were not drawn out into trails. This speed made them useful for small cameras as well as for larger instruments, and they were successfully used in stellar spectrographs. This has a very special advantage when a spectrograph is used with a large reflector. All optical elements are then mirrors except for the correcting plate of the Schmidt. If this plate is made of quartz and all the mirrors are coated with aluminum, the instrument becomes very fast and efficient for spectral observation in the ultra-violet.

A distinctive new instrument for solar research was developed at McMath-Hulbert observatory, near Pontiac, Mich., where a new 70-foot tower telescope specially designed for photographing solar phenomena was installed. This new tower telescope was equipped with a spectroheliograph and numerous automatic devices for the efficient photographing of prominences and other solar phenomena on cinema film. It gave a two-dimensional

picture of a solar prominence while a second tower telescope, formerly used for this purpose, could be used to obtain velocities of the gases toward or away from the observer. Thus simultaneous observation with the two telescopes yielded a record of the motions of the gases of a prominence in three dimensions. This made possible the construction of three-dimensional models of some of them.

The Solar System.—Bernard Lyot, working at the Pic du Midi in France, obtained motion pictures of solar prominences by a technique different from that used at McMath. Instead of using a spectroheliograph, Lyot recorded direct photographs of the prominences on motion picture film with the same ingenious telescope (coronagraph) used for photographing the corona without an eclipse. This new method met with such success that Lyot further improved his observing technique by mounting a special polarizing device on his telescope. Using appropriate filters he was then able to photograph prominences simultaneously in three colours.

A by-product of Lyot's studies of the corona was the measurement of 22 spectral lines produced in this portion of the solar atmosphere. Identification of these and other coronal lines was one of the great unsolved problems relating to the solar spectrum. It was known that these lines must be produced by familiar chemical elements which existed under unusual conditions. Bengt Edlén made a systematic study of the spectra of highly ionized

atoms and was able to identify 15 of the coronal lines which, it was estimated, supply approximately 97% of all the radiation received from the corona. Edlén found that seven of these lines were produced by highly ionized iron, six of them by highly ionized nickel, and two by highly ionized atoms of calcium. Some of the lines had not yet been measured in the laboratory, but enough was known about the ionized states of these atoms from Edlén's studies to make his identifications reasonably certain. The other seven lines measured by Lyot and an additional seven new coronal lines measured by Donald H. Menzel and Robert M. Petrie on plates obtained at the total eclipse of the sun in 1936 remain unidentified. It was quite certain, however, that they were also produced by known chemical elements in a high state of ionization.

Two astronomers gained unusual distinction while observing the total solar eclipse of June 8, 1937. The path of totality crossed the Pacific ocean, touching no land except a few small islands until it reached the coast of Peru just before sunset. J. Q. Stewart and J. A. Stokley observed this eclipse from the deck of a freighter which was moving along the central line of totality and in the direction of motion of the shadow. The eastward motion of the ship lengthened the time they were able to observe totality by four seconds. They timed the duration of totality as 7 min. 6 sec. and thus had the distinction of seeing a longer totality than anyone before them.

The eclipse of July 9, 1945, was observed by more astronomers, professional and amateur, than any other total eclipse for many years. Astronomers from observatories of the U.S. and Canada and many co-operating amateurs were scattered along the path of totality in North America. Several groups of European astronomers observed the eclipse from northern Sweden, and more than 20 groups of soviet astronomers were located along the eclipse path in the U.S.S.R. The most spectacular expedition for the observation of this eclipse was that conducted by the Royal Canadian Air Force under the leadership of Peter M. Millman. Four air force planes carrying eight cameras made flights through the path of totality. Three of the cameras had objective prisms mounted in front of the lenses and recorded excellent pictures of the flash spectrum. The preliminary reports indicated that this operation was the most successful attempt yet made to photograph the eclipsed sun from aircraft.

The law of limb darkening of the sun continued to be difficult to determine. Many measurements of solar limb darkening were made without an eclipse, but these were inevitably affected by unsteadiness of the solar image produced by the atmosphere of the earth. Measurements of brightness of the crescent phases of a total solar eclipse obviated this difficulty because the occulting disk was then the moon, with its sharp edge, rather than a disk in the observer's telescope. The results of observations of limb darkening at the total eclipse of 1936 were published in 1941 by J. G. Ferwerda, J. Uitterdijk and A. J. Wesselink. They used an exceptionally ingenious photographic method to make their measurements. Ordinary spectacle lenses with different radii of curvature were aluminized on the convex surface and mounted on a board; when photographed with motion picture cameras these lenses gave images of the crescent sun in different densities. Careful measurements of the photographs indicated that the brightness close to the limb of the sun varies approximately as the tenth root of the distance from the limb. Nearer the centre of the solar disk the brightness was found to vary as the cube root of this distance.

Measurements of the colour of the thin solar crescent during the last minute before totality at a time when the light received is only 1/100th of full sunlight showed that there was no change of colour. This constancy of colour could be explained by the existence of a nearly isothermal layer near the surface of the sun. Rupert Wildt reached a similar conclusion as a result of his thorough analysis of the large collection of flash spectra obtained by S. A. Mitchell at a number of total eclipses.

For many years students of the solar spectrum had to depend on estimated intensities of the Fraunhofer lines, principally on the estimates of H. A. Rowland. The scale of intensities given by Rowland was carefully calibrated, and intensities of a few hundred of the stronger Fraunhofer lines had been measured with considerable precision. In 1941 M. Minnaert and his colleagues at Utrecht published a Photometric Atlas of the Solar Spectrum. This prodigious volume contained 174 pages (more than 300 feet) of microphotometer tracings of the sun's spectrum on a direct-intensity scale. The tracings covered the spectral region λ_{3332} to λ_{8771} with a scale of approximately 2 cm./A. From them, wave lengths based on the Revised Rowland Table could be read with an accuracy of about 0.01 A. Central intensities read from the Atlas were correct to about 5%. The value of this great piece of work to spectroscopists could not be overestimated.

Identification of the spectral lines of two more chemical elements in the solar spectrum—thorium and gold—was announced by Charlotte E. Moore and A. S. King in 1943. With their detection the number of chemical elements identified in the solar atmosphere was raised to 66. Thorium was the first radioactive element to be detected in the sun's atmosphere.

The existence of chemical compounds in the solar atmosphere had long been known, but few could be identified because of insufficient laboratory data about the spectra of the compounds. The characteristic spectral bands were exceedingly complicated for many of the molecules. In the solar spectrum there was considerable overlapping of these bands in addition to the fact that they were superimposed on a very rich atomic spectrum, making their identification very difficult. In 1945 Harold D. Babcock succeeded in identifying the bands of 18 compounds in the spectra of both sunspots and the solar disk. Of these 18, the 7 compounds not formerly identified were BH, MgF, SrF, YO, ScO, MgO, O₂. There still remained numerous unidentified molecular absorption bands in the spectra of sunspots.

Observers of the sun using spectrohelioscopes had frequently seen the development of bright patches much more brilliant than the surrounding solar disk. These bright solar outbursts, involving no observable motion of material, were called solar flares. As early as 1931 George E. Hale had noted that these flares often preceded brilliant auroral displays and widespread magnetic storms. He concluded that there was probably a distinct connection between flares and the terrestrial phenomena which succeeded them. In 1944 a thorough study of the relation between solar flares and magnetic storms was made by H. W. Newton. He showed that many flares observed within 45° of the centre of the sun's disk were followed approximately a day later by intense magnetic storms, and that the number of these storms which followed flares was greater than could occur by chance. He assumed that a stream of corpuscles is ejected from the sun when a bright solar flare is observed and that this corpuscular stream

travels out into space until it strikes the earth and produces a magnetic storm. From a study of the intervals of time between the appearance of flares and the occurrence of a magnetic storm, Newton determined the mean effective time of travel of the corpuscular stream to be about 26 hours. In the case of the most intense magnetic storms, a shorter travel time of about 20 hours was found. E. A. Milne's theoretical work on the ejection of high-speed atoms from the sun, produced by radiation pressure, had indicated a travel time for these atoms from the sun to the earth of 1.1 days. A comparison of these results would seem to indicate that the assumptions on which Milne's theoretical work was based were substantially correct. Newton found that the very intense magnetic storms were associated with flares occurring on the preceding side of the sun's central meridian, and suggested that the streams which produce these storms mostly strike the earth "head on." He found that the smaller magnetic storms tend to recur at intervals of a solar rotation and assumed that in this case the corpuscular stream was ejected more or less continuously over a considerable period of time. The stream would then partake of the solar rotation and overtake the earth in its orbit.

The light of the aurora most frequently observed had been that produced by an emission line in the green region of the spectrum. In 1945 Joel Stebbins and A. E. Whitford discovered a new auroral radiation in the infra-red. Found in the course of precise photometric observations of stars and nebulae, the new radiation was far more intense than the familiar green line. It was shown to be atmospheric in origin and to have an approximate wave length of 10,440 A. Strangely enough, no correlation was observed between this radiation and magnetic disturbances such as are usually found during auroral displays. P. Swings identified it as probably being due to emission of the (O, O) band of nitrogen. He suggested that nitrogen molecules, and compounds containing nitrogen atoms, are dissociated into nitrogen atoms by the absorption of ultraviolet solar radiation during the day. The nitrogen atoms would recombine during the night, chiefly in three-body collisions of two atoms and a nitrogen molecule. Such a collision would yield one normal and one excited nitrogen molecule, and the excited molecule would then emit the observed infra-red radiation. It was well known that nitrogen molecules are a major constituent of the earth's atmosphere at any altitude, and Swings' suggested mechanism of emission offered a plausible explanation of the observed infra-red radiation.

On Oct. 28, 1937, K. Reinmuth at Heidelberg discovered a fast-moving object of the tenth magnitude. Its hourly motion across the sky was approximately two-thirds of the apparent diameter of the moon. This motion was so rapid that American observers had difficulty in locating it, and only a few observations of this object were obtained. The entire series of observations covered less than five days, but these few observations were sufficient to determine a preliminary orbit of this object. It proved to be a minor planet with a probable diameter of less than a mile, and on Oct. 30 it approached to within 485,000 miles from the earth. Reinmuth appropriately named it Hermes.

In the summer of 1937 with the aid of the 100-inch reflector at Mount Wilson, Calif., Seth B. Nicholson discovered two new satellites of Jupiter, both extremely faint. Satellite X was 7,000,000 miles from Jupiter when it was discovered and Satellite XI was at a distance of 10,000,000 miles from Jupiter.

New and greatly improved orbital elements for the planet Neptune were derived by Lloyd Wylie, as a result of a very thorough comparison of Simon Newcomb's theory with all observations from 1795 to 1938. As a by-product of this investigation, Wylie was able to make a new determination of the mass of Pluto, which he found to be practically identical with the mass of the earth. H. L. Alden made new observations of the satellite of Neptune, Triton, and found Triton's mass to be 0.02 the mass of the earth, or 1.8 times the moon's mass.

A new calculation of the surface temperature of Venus was made by Rupert Wildt. The atmosphere of this planet was known to contain a high percentage of carbon dioxide. Laboratory measurements of the radiation emitted by gaseous carbon dioxide were used by Wildt to calculate the extent of the "greenhouse effect" which this gas could produce in the planet's atmosphere. He calculated the temperature of the subsolar point on Venus as between 93° C. and 135° C. It seemed likely, therefore, that the surface temperature of the planet might be somewhat above the terrestrial boiling point of water.

During 1944 G. P. Kuiper at the McDonald observatory made a series of spectrographic observations of the nine largest satellites in the solar system. He discovered that the largest of Saturn's satellites, Titan, has an atmosphere of methane and possibly ammonia. It seemed certain that Titan's atmosphere was probably formed after the satellite had cooled, for had the satellite ever had as high a temperature as that of the earth, any atmosphere would have escaped.

One of the fundamental yardsticks used by astronomers is the distance of the earth from the sun, frequently expressed as the solar parallax. The minor planet Eros, which comes within 16,000,000 miles of the earth at closest approach, is a good object to measure for a precise determination of the sun's parallax. A close approach had occurred in the winter of 1931, and at that time an extensive international campaign was carried out to observe the asteroid. More than 30 observatories co-operated in obtaining many thousands of observations. The results of this great cooperative effort were published in 1941 by H. Spencer Jones, who had undertaken the exacting task of reducing and analyzing the observations. The new value for the solar parallax obtained from these observations was 8".790. A by-product of the same observational material yielded a new value for the ratio of the mass of the earth to that of the moon-81.271.

The light reflected from Eros varies in a period of approximately 5 hr. 17 min. This variation had been attributed to the irregular elongated shape of the asteroid as it rotates about its shortest axis. In 1941 Franklin Roach made precise photoelectric observations of the asteroid on six nights. He found that the main features of the resulting light curve could be explained by assuming an ellipsoidal figure with dimensions in the ratio 1:4:13. Small departures of the observed light from such a theoretical curve suggested, however, that the geometrical figure of the asteroid is irregular, a conclusion previously expressed from far less accurate data.

Stars.—Detailed studies of two eclipsing stars VV Cephei and ϵ Aurigae had shown them to have exceptionally large components. The peroid of ϵ Aurigae is 27 years with an eclipse lasting nearly two years. Only one spectrum of this star was visible. G. P. Kuiper, Otto Struve and Bengt Strömgren made a very thorough study of this interesting eclipsing binary. They found that the bright star is approximately 190 times the sun's diameter and that the dark one, called an infra-red star, has a diameter 2,700

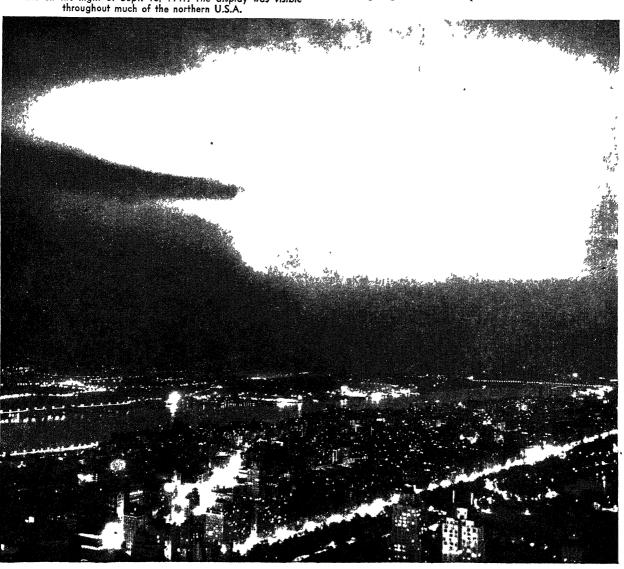
times that of the sun. The orbit is so inclined that the bright star passes behind only the outer part of the darker star. This outer part is practically transparent except for an ionized shell produced by the bright star. This ionized shell causes a weakening of the light of the bright star without greatly affecting the spectrum. VV Cephei is a similar type of binary. An extensive spectrographic study of this star by Victor Goedicke showed that the fainter red star in this case has a diameter approximately 12,000 times that of the sun. The brighter star of this pair is a hot B-type star. The faint component of ϵ Aurigae was the largest star known in 1946.

The measurement of visual double stars had sometimes been thought to be a rather unprofitable form of astronomical investigation. In 1943 K. Strand showed in spectacular fashion that this was not so. Strand had made an extensive series of photographs of the binary 61 Cygni. A thorough study of these and earlier observations clearly showed perturbations in the orbit of the visual components which were produced by a third invisible body. Strand found that he could explain these perturbations satisfactorily if he assumed that the third body had a mass of only 0.016 that of the sun (16 times the mass of Jupiter). The smallest stellar mass previously known was 0.14 the

The glitter of New York city's lights was outdone by the Aurora Borealis on the night of Sept. 18, 1941. The display was visible throughout much of the northern U.S.A.

mass of the sun. Hence this dark component of 61 Cygni must have so little luminosity, if indeed it has any, that it may be considered a planetary object. Thus, for the first time in history a planet had been discovered outside the solar system. This planet moves about one of the visible components in a period of 4.9 years. The semimajor axis of its orbit is 2.4 astronomical units but because its orbit is highly eccentric it comes within 0.7 astronomical unit of its visible companion at closest approach. Therefore 61 Cygni is a three-body system with one of its components planetary. It is 11 light years away from the earth and thus one of the sun's nearest neighbours. The visible components, red dwarf stars, revolve around their common centre of gravity in a period of 720 years. This discovery of a planetary body outside the solar system promised to alter greatly the viewpoint of astronomers concerning the possibility of the existence of other planetary systems.

Studies of eclipsing binaries had provided considerable information about the nature and physical constitution of the stars, and astronomers paid much attention to these interesting double stars during the decade 1937–46. In 1939 Gerald P. Kron obtained a highly precise light curve of the eclipsing star YZ Cassiopeiae from which he was able





Balloon clusters ready to be sent into the stratosphere. University of Chicago scientists tested for cosmic ray activities accompanying the meteoric shower visible to many U.S. observers on Oct. 9, 1946

to determine the amount of limb darkening of the brighter star. This was the most precise determination of a star's limb darkening yet made. Kron found a darkening coefficient for the large A3 star of 0.49. The theoretical value of the darkening coefficient for an A3 star was determined in 1945 by H. N. Russell as 0.51 and thus in close agreement with Kron's observed value.

The third magnitude star Beta Lyrae had long been one of the most interesting and puzzling of eclipsing binaries. Literally thousands of spectrographic and photometric observations had been made of it. During 1941, astronomers at the Yerkes observatory, Williams Bay, Wis., combined their efforts to try to explain some of the puzzling features of this eclipsing pair. Their intensive study indicated that the two stars are so close together that their atmospheres actually merge. The denser of the two, by its attraction on the particles lying between them, sets up a current of gas in their atmospheres. G. P. Kuiper found that although this gaseous stream would circulate about the stars, some of it would escape as a great spiral of gas which would form a disk of gaseous material lying in the orbit plane. Since the plane of the orbit is nearly edgewise toward observers, the gas in the spiral comes between the earth and the stars. This remarkable model of a binary system might or might not be correct. However, it was based on a thorough study of the spectra and careful dynamical calculations, and it offered an explanation for most of the puzzling features of this system. Otto Struve later found several other eclipsing pairs with characteristics similar to Beta Lyrae and for which a similar model offered the only plausible explanation then available. Apparently it should be concluded that a number of close eclipsing pairs have streams of gas associated with them.

It had long been apparent that any mechanism proposed to account for the source of stellar energy must involve a transformation of mass into energy. In 1939 Hans Bethe investigated possible transformations that could occur under conditions existing in the interiors of ordinary stars. He found that a chain reaction involving carbon as a catalyst and the transformation of hydrogen into helium would supply sufficient energy for the sun at central temperatures of 18,000,000 to 21,000,000 degrees. The central temperature would depend on the percentage of hydrogen and nitrogen available, and the values obtained by Bethe from nuclear theory agreed satisfactorily with the central temperature of the sun determined from astrophysical data. Apparently Bethe had discovered the chief source of energy for stars of the main-sequence, although this so-called carbon cycle did not explain the very rapid radiation of giant stars. A spectroscopic study of v Sagittarii by Jesse Greenstein indicated that this star's atmosphere contains a higher percentage of helium than of hydrogen. This might mean that the star has already used up much of its hydrogen and thus is well advanced in the "life history" outlined by Bethe.

In the 1920s, several investigators had suggested that the well-known Crab nebula in Taurus was probably the same object as the "guest-star" observed in the far east in A.D. 1054. Further studies of this nebula were made during

1942 by Nicholas Mayall and J. H. Oort. The observed rate of expansion indicated that it could have been produced by a stellar outburst about A.D. 1100, and the position in the sky is approximately the same as that of the "guest-star" observed in China and Japan. Since the rate of expansion of the nebular gas need not have been constant, the discrepancy in time was not serious, and these observers concluded that the "guest-star" or nova of 1054 was really a supernova. The evidence seemed conclusive that the Crab nebula was produced by this spectacular stellar outburst in the year 1054.

Galaxies.-Studies of the structure of our galaxy are complicated by the existence of clouds of obscuring matter. In 1939 Joel Stebbins and his associates reported results of precise photoelectric measures of the colours of 1332 B-type stars. These measures indicated that absorption of the obscuring clouds varies inversely as the wave length and that the strongly reddened B-stars are all found near the plane of the Milky Way in the region where no extragalactic nebulae are observed. Stebbins' results showed clearly that within the first 2,000 parsecs from the sun the absorbing material is very irregularly distributed and cannot be represented by a mean absorption coefficient. A study by W. S. Adams of interstellar spectral lines produced by these obscuring clouds indicated that they contained a high percentage of calcium and hydrogen. Lines produced by molecules of CH and CN were also found. The radial velocities of some of the clouds were found to be remarkably high. One cloud in the direction of Sagittarius was found to be receding at a velocity of 40 km/ sec. and a cloud in the direction of Cygnus showed a recessional velocity of 60 km./sec.

The direction of rotation of spiral nebulae remained difficult to determine because of the ambiguity in regard to the tilt. Edwin P. Hubble made a thorough study of this problem and was able to get rid of the ambiguity in the cases of four of these galaxies. He found that in these galaxies all of the spiral arms are trailing, and since he had established that 11 other spirals rotate in the same direction as these 4, he concluded that the spiral arms of all 15 are trailing.

A measurement of the angular velocity for the outer spiral arms of the Andromeda nebula was made by Horace Babcock. He found a constant angular velocity and an angular velocity within 10' of the nucleus of approximately zero. This seemed to indicate that a large proportion of the nebular mass is in the spiral arms rather than in the nucleus. Similar investigations of the spiral nebulae Messier 31 and 33 by A. B. Wyse and Nicholas Mayall indicated that in these nebulae the mass is likewise widely spread throughout the system, and shows very small concentration at the centre. The contrast of these results with the concentration of light near the centre of the galaxies indicated that there is no direct relation between distribution of luminosity and that of mass. Determinations of the rotation of our own galaxy were interpreted as showing high central condensation of mass. Although this might be true, the observations did not necessarily demand such an interpretation and it might be that the distribution of mass in our galaxy is more nearly similar to that found in these extragalactic spirals. Star counts in the Andromeda nebula by C. K. Seyfert and J. J. Nassau indicated that this galaxy and our own are very similar. Measures of colour in seven spirals showed the arms to be much bluer than the nucleus, and this difference in colour might be significant in explaining the contrast between high concentration of light and low concentration of mass near the centres of the galaxies.

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Atatürk, Kemal

4 Ataturk (1881–1938), Turkish statesman (originally Mustafa Kemal), was born at Salonika. He became president of the national assembly in 1920 and president of the Turkish republic on Oct. 19, 1923. During his 15-year administration, he introduced a thorough westernization of Turkish social and cultural life. He was equally eminent as a military leader and as a social and political reformer; in foreign policy he showed a realistic moderation characteristic of great statesmanship. Among his own people, he achieved a wide popularity. He died at the Dolmabaghche palace in Istanbul on Nov. 10, 1938.

ATC

See AIR TRANSPORT COMMAND.

Atcheson, George, Jr.

Atcheson (1896—), U.S. diplomat, was born Oct. 20, 1896, in Denver, Colo. He was graduated from the University of California in 1919 with a B.A. degree. During World War I, he served in the U.S. army (1918–19) as an aeronautics instructor. Entering the diplomatic service, Atcheson was a language officer at the U.S. legation in Peking in 1920. While in Peking, he attended the College of Chinese Studies, receiving an M.A. degree in 1924. In later years, he served in consular posts in Tientsin (1928), Foochow (1928–29) and Nanking (1934), and in secretarial posts in the U.S. embassy in China.

Atcheson, who was assistant chief of the division of far eastern affairs in 1941–42, returned to the orient in late 1942 as counsellor of the U.S. embassy at Chungking. He clashed frequently with Gen. Patrick J. Hurley when the latter was U.S. ambassador, and in May 1945 Hurley had Atcheson and other members of the embassy staff removed on grounds of insubordination. Subsequently Hurley charged that Atcheson had sent a letter to the state department recommending that lend-lease aid be shipped to China's communist forces; if carried out, Hurley asserted, this move would have resulted in the downfall of Chiang Kai-shek's government. However, Sec. James Byrnes subsequently cleared Atcheson, declaring that there was no proof of "disloyalty."

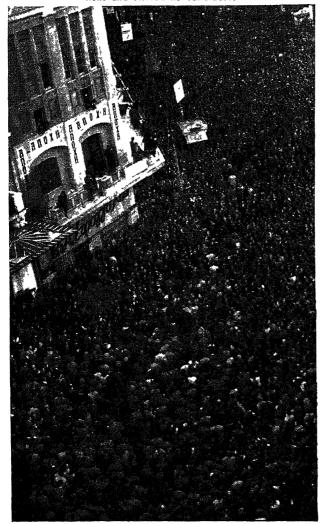
Byrnes announced on Sept. 4, 1945, that Atcheson had been appointed acting political adviser to Gen. Douglas MacArthur in Tokyo. The two worked together harmoniously and in April 1946, MacArthur named Atcheson U.S. member of the four-power Allied council for Japan. Atcheson battled continually with Lt. Gen. Kuzma Derevyanko, soviet member on the council; at the height of their disagreements, Atcheson warned May 15, 1946, that the U.S. did not favour communism "in the United States or Japan." His position was upheld by Dean Acheson, undersecretary of state. Subsequently Atcheson opposed the soviet delegate's recommendations for land reform in Japan and accused the U.S.R. of violating the Pots-

dam agreement because of its failure to repatriate any Japanese troops captured in their far eastern area.

Athens

After Germany's defeat of Greek and British troops north of the Gulf of Corinth in April, 1941, nazi forces split the country in two, entered Athens on April 27 and hoisted the swastika over the Acropolis. King George II of Greece had fled to Crete with his government several days before, and a puppet regime under General George Tsolakoglou was set up in Athens on April 30. Immediately the invaders began looting food stores and confiscating essential materials, with the result that factories closed and starvation followed. Young males were drafted into nazi labour gangs or deported, while captives from other Greek cities were marched through the streets of Athens. A wave of sabotage swept the city, and mass killings occurred frequently. So numerous were the deaths from murder and famine that there was insufficient wood for coffins to bury the dead. After more than three years of bondage, British forces landed again in Greece early in Oct. 1944, and the Germans announced on Oct. 13 that they had evacuated the capital. In December civil war flared in Athens between E.L.A.S., military arm of

E.A.M. protest rally in Athens on the eve of the Greek national elections of March 31, 1946. Leftist groups boycotted the elections and offered no candidates



the leftist E.A.M., and British-supported rightists. Street fighting between leftist guerrillas and British forces continued for several weeks, with considerable casualties among civilians, despite Prime Minister Churchill's hurried flight to Athens on Christmas day. Athens was strike bound; all gas, electricity and communications were cut off. Peace was gradually restored during Jan. 1945, and martial law ended the following month. (See GREECE.)

Athletics

See TRACK AND FIELD SPORTS; etc.

Athlone, 1st Earl of

The earl of Athlone (Alexander Augustus Frederick George Cambridge) (1874—), British statesman and brother of Queen Mary, was born April 14, 1874, at Kensington palace. The third son of the 1st duke of Teck, he was given the title of Prince Alexander of Teck. He was educated at Eton, and the royal military college at Sandhurst. He served in the Boer War, and was twice mentioned in dispatches during World War I. In 1917, he relinquished the styles and titles of highness and prince at the request of King George V and assumed the surname of Cambridge. That same year, he was created 1st earl of Athlone. He was governor general of the Union of South Africa, 1923–31.

Appointed 16th governor general of Canada April 3, 1940, on the death of Lord Tweedsmuir, he opened the Canadian parliament in Jan. 1944 with an appeal to all nations engaged in World War II to seek a permanent peace through world organization. On April 12, 1946, he was succeeded as governor general of Canada by Viscount Alexander of Tunis.

Atlantic Charter

See International Conferences, Allifd (World War II'; Tariffs; United States.

Atom

See Atomic Bomb; Chemistry; Physics.

Atomic Bomb

The wholesale release of atomic energy, in the form of atomic bombs, was in many ways the outstanding event of the decade 1937–46. It was one of the greatest triumphs in the history of science, perhaps the most significant development in the progress of mankind after the discovery of the use of fire. It had equally vast potentialities for good and for evil. Used in another war, it would probably result in the destruction of civilization. But in its peaceful application to industry, transportation and other activities, it promised the start of a new era, the Era of Atomic Energy, capable of becoming the most glorious period in the history of mankind.

It became apparent, soon after the surrender of Japan in 1945, that the most pressing problem before the world was the control of the atomic bomb, and that no permanent solution of the international problem was possible without it. The U.S., in addition, faced the problem of evolving a domestic policy with respect to the future of atomic energy.

Based on the discovery of uranium fission by O. Hahn and F. Strassman in Germany in 1939, the atomic bomb was perfected in the U.S. during World War II as a joint venture of the U.S., British and Canadian governments. Five bombs had been detonated so far in the history of the world at the end of 1946—three in tests and two in actual warfare.

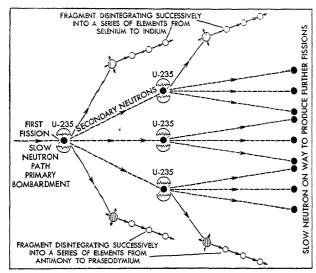


Diagram of a fission chain reaction. A slow neutron enters the uranium isotope U-235, destroying its equilibrium. The unstable isotope splits into two initial fragments, each of which decays rapidly into a whole series of radioactive and stable elements, and a considerable excess of neutrons. The fast neutrons freed by fission are slowed by moderators (not shown in diagram), strike other atoms of U-235, and the action spreads rapidly

The first bomb was exploded in a test on the New Mexico desert on July 16, 1945. Two atomic bombs were dropped on Japan from U.S. aeroplanes, the first (with more power than 20,000 tons of T.N.T.) on Hiroshima on Aug. 6, 1945 (Japanese time), the second on Nagasaki on Aug. 9, 1945 (Japanese time). Japan surrendered on Aug. 14, 1945. Former Prime Minister Winston Churchill estimated that by shortening the war, the atomic bomb had saved the lives of 1,000,000 U.S. soldiers and 250,000 British soldiers. Two more atomic bombs were exploded in tests held by joint army-navy task force 1 of the U.S. in manoeuvres known as "Operation Crossroads" at Bikini lagoon in the Marshall Islands. The first of these two bombs was detonated in the air on July 1, 1946 (Bikini time), the second was exploded under the waters of the lagoon on July 25, 1946 (Bikini time).

Science's turning point in the quest for atomic energy came in Jan. 1939, eight months before the start of World War II, with the announcement by Hahn and Strassman that barium was one of the products when uranium was bombarded with neutrons. The significance of this discovery was communicated by Lise Meitner and O. R. Frisch, refugees from Germany in Copenhagen, to Prof. Niels Bohr, who was preparing to visit the U.S. Arriving in the U.S. on Jan. 16 Bohr discussed the theory with Albert Einstein, J. A. Wheeler and others. It meant that the uranium atom had split into two nearly equal fragments, an atomic transmutation from the end of the periodic table where the binding force is least to the centre of the table where it is greatest. Calculations showed that such a "fission" of the uranium atom should release an incredible amount of energy, nearly 200,000,000 electron volts. It meant that one pound of uranium would produce by fission as much energy as the combustion of 20,000,000 lb.

Bohr and Enrico Fermi discussed uranium fission at a conference on theoretical physics in Washington, D.C., on Jan. 26, 1939, and Fermi made the further suggestion that neutrons might be released during the process. Here then was the possibility of a chain reaction of the type needed for the wholesale release of atomic energy. These sugges-

tions threw the meeting into an uproar while those physicists whose laboratories contained cyclotrons rushed to the telephone to initiate by long-distance calls experiments seeking to confirm this phenomenon of fission.

Subsequent theoretical studies by Bohr and Wheeler indicated that slow neutrons did not cause fission in ordinary uranium, or U-238, so-called because its mass number is 238, but in U-235, an isotope of mass number 235, present in ordinary samples of uranium to the extent of 1 part in 140. Gradually the many riddles presented by fission were solved and by June 1940 the basic facts concerning the release of atomic energy were known throughout the scientific world.

One important result of these studies was the discovery that with neutrons of certain speeds U-238 exhibited a high probability for neutron capture, becoming an unstable isotope, U-239, which by emitting a beta particle became a new element, No. 93, to which the name of "Neptunium" was given. But this was also unstable and by emitting another electron became element No. 94, named "Plutonium." It was also found that fission took place in both thorium and protoactinium with fast neutrons.

It was realized that the setting up of a chain reaction depended upon the number of neutrons released by the initial fissions and their subsequent fate. A neutron might escape without accomplishing any effect, it might take part in nonfission capture, or it might cause fission. The ratio of neutrons causing fission to the other neutrons is known as the multiplication factor. For a chain reaction it must be greater than one. It was also realized that the size and shape of the mass of uranium would be a factor in bringing about a chain reaction.

Physicists therefore foresaw two possibilities. One was the setting up of a chain reaction in ordinary uranium, a mixture of U-234, U-235 and U-238, employing slow neutrons for the controlled release of atomic energy for power purposes. The other was the creation of a chain reaction of explosive character in pure U-235 or plutonium with fast neutrons. This would be an atomic bomb. It was believed that the controlled reaction would require at least several tons of uranium whereas the critical size of the bomb would be between 1 and 100 kg.

A complication in obtaining the controlled reaction arose from the fact that fission releases high-speed neutrons whereas slow neutrons are the most desirable for producing fission. The suggestion was made that the uranium be mixed with some other substances of a character such that the neutrons would be slowed down by elastic collisions with its atoms. Hydrogen, deuterium, beryllium and carbon were suggested for this "moderator," as it was named. Fermi and L. Szilard proposed a superior method, namely, to embed lumps of uranium in a matrix of some moderator not unlike raisins in a cake. This construction came to be known as a "lattice" and the resulting structure as a "pile."

Construction of a bomb, therefore, required either the separation of pure U-235 from ordinary uranium or the construction of a uranium pile, not primarily for the generation of power but the transmutation of U-238 into plutonium which could then be separated by chemical means. The first sample of pure U-235 was isolated by Alfred O. Nier in Feb. 1940 by means of the mass spectrograph. Slightly larger amounts were produced shortly thereafter by K. H. Kingdon and H. C. Ollack.

Manhattan Project.—The story of the production of the atomic bomb was in many ways as unique as the bomb



Desolation of Hiroshima after the first atomic bombing of Japan on Aug. 6, 1945. An area of 4.1 sq.mi., or 60% of the city, was laid waste when the single bomb was dropped by U.S. fliers

itself. While engaged in one war in Europe and another in the Pacific, the U.S. marshalled the manpower and resources needed to complete in four years a project that otherwise might have taken half a century. The cost of the project, \$2,000,000,000, indicated its magnitude.

It was difficult to assign credit to all who took part in the venture. A brilliant group of U.S., British and refugee scientists formed its heart. But later, as the project developed and vast plants had to be built and tens of thousands of workers employed, the co-operation of a large number of the nation's chief industrial corporations as well as that of the war department and other branches of the government was required. The decision to embark on the project was made by Pres. Roosevelt himself.

The first contact with the government was made by George B. Pegram of Columbia university, who arranged a conference between Fermi and officers of the navy in March 1939. In July, L. Szilard and E. Wigner conferred with Einstein and later the three went to New York city to talk with Alexander Sachs. Supported by a letter from Einstein, Sachs explained the importance of the problem to Pres. Roosevelt, who appointed an advisory committee on uranium with L. J. Briggs, director of the national bureau of standards as chairman, to look into the problem. In Feb. 1940 a fund of \$6,000 was made available to start researches; probably no one then realized that this was the

beginning of a \$2,000,000,000 expenditure. By this time, it was well known that Hitler had embarked German physicists upon atomic bomb researches. The British were also studying the problem, and in the fall of 1941, Harold C. Urey and G. B. Pegram visited England to get first-hand information on what was being done there.

On Dec. 6, 1941, the project was put under the direction of a uranium section of the Office of Scientific Research and Development (OSRD). Members of this section were James B. Conant, representing Vannevar Bush, the director of the OSRD; L. J. Briggs, chairman; G. B. Pegram, vice-chairman; A. H. Compton, program chief; E. O. Lawrence, program chief; H. C. Urey, program chief; E. V. Murphree, chairman of the planning board; H. T. Wensel, technical aide; S. K. Allison; J. W. Beams; G. Briet; E. U. Condon; and H. D. Smyth. There was also created a "Top Policy Group," consisting of Pres. Roosevelt, Vice-Pres. Wallace, the secy. of war, the chief of staff, Bush and Conant. On June 18, 1942, the war department organized a new district in the corps of engineers to carry on the work of the atomic bomb. This was named the Manhattan District, and on Sept. 17, 1942, Brig. Gen. L. R. Groves was placed in complete charge of all army activities relating to the project. A number of British scientists were

transferred to the U.S. in 1943 and in August of that year a combined policy committee, representing the U.S., Great Britain and Canada was set up.

Because there was no way of knowing in advance what method would succeed, it was decided to work simultaneously on several methods of isolating U-235 and also on the production of plutonium.

The first experimental pile—a graphite cube about eight ft. on edge and containing about seven tons of uranium oxide—was set up at Columbia university in July 1941. At the end of the year the work on such piles was transferred to the University of Chicago, where a considerable number of related problems were being studied by a group, under the direction of A. H. Compton, in the cryptically-named "Metallurgical laboratory." On Dec. 2, 1942, the first self-sustaining chain reaction pile was put into operation, thus establishing that such a pile was feasible for the controlled release of atomic energy for power purposes or the manufacture of plutonium.

It was felt that the time had arrived when a pilot plant for the production of plutonium could be built, and it was decided to locate it on the site which had been acquired in the Tennessee valley and named the Clinton Engineer Works. This was a 70 sq.mi. tract on the Clinch river about 30 mi. from Knoxville, Tenn. A more isolated site was subsequently chosen for the full size plants, a 1,000 sq.mi. tract on the west bank of the Columbia river, north of Pasco, Wash., named the Hanford Engineer Works.

An enormous number of engineering problems had to be solved in building the Hanford uranium piles. They were so designed that the uranium was employed in the form of rods encased in metal containers. These were inserted into the piles by automatic machinery governed by remote control since no one could safely enter the chamber where a pile was located. They were subsequently removed by similar means and transported to the plants where the plutonium was separated. These likewise had to operate by remote control because of the radioactivity of the fission products in the uranium rods. Heavy concrete walls were built as shields to protect workers from the radiations released by the uranium piles and separation plants.

Meanwhile, at the end of 1941, the problem of separating U-235 from ordinary uranium had been assigned to two groups working under the direction of Urey and Lawrence. A method of separation by means of gaseous diffusion was developed by Urey and his group. This required the conversion of the uranium into a gaseous compound which was then permitted to diffuse through porous barriers. Since the rate of diffusion differs for the various isotopes, a separation was thus effected.

Lawrence and his group developed an electromagnetic method of separation which was essentially an extension of the mass spectrograph. It operated upon the principle that the amount by which a magnetic field bends the path of a stream of nuclei from a straight line depends on the weight of the nuclei. Huge plants employing both methods were built at the Clinton Engineer Works. Subsequently, in order to speed up the production of the electromagnetic plant, a thermal diffusion plant, using a method developed by P. H. Abelson, was built to make a preliminary separation of the isotopes.

For the final stages of the project, it was felt wise to establish an atomic bomb laboratory in an isolated place, both for the sake of secrecy and safety. A site was chosen at Los Alamos, N.M., on a mesa about 20 mi. from Santa Fe. J. R. Oppenheimer assumed direction of this laboratory in March 1943. A group of brilliant physicists, chem-

ists and authorities on explosives and weapons, recruited trom all parts of the U.S. and including H. Bethe, R. R. Wilson, J. W. Kennedy, C. S. Smith, Capt. W. S. Parsons, G. B. Kistiakowsky, R. F. Bacher and E. Fermi among others, moved into the laboratory. Sir James Chadwick and Niels Bohr also spent much time at Los Alamos.

By this time, researches had revealed that in a mass of either U-235 or plutonium of a certain critical size, a fast neutron chain reaction would take place in which the multiplication of neutrons would be so rapid as to bring the reaction to the point of explosive violence. The problem before the Los Alamos laboratory was to determine with great exactness this critical size and then to design a mechanism for bringing smaller masses of the material together quickly. The chain reaction would then cause the explosion. An obvious method of assembling the bomb was to load half of it into a gun and shoot it into the other half of the bomb which served as a target.

New Mexico Test.—The first atomic bomb in the history of mankind was exploded at 5:30 A.M. on July 16, 1945, at the Alamogordo air base in the desert 120 mi. southeast of Albuquerque, N.M. The bomb had been placed on a tall steel tower while scientists and military experts occupied observation posts placed at distances ranging from 10,000 to 17,000 yd. from the tower. They had been instructed to lie down with their feet toward the tower and to protect their eyes from the blinding flash of the explosion. The skies were dark and it was raining, with occasional lightning.

The explosion caused a flash that illuminated the mountain peaks 10 mi. away. Then came a tremendous, sustained roar accompanied by a tornado-like burst of wind. Where the tower had stood there was a great boiling, surging cloud of many colours rising into the stratosphere, more than 40,000 ft. in height. The heat of the explosion estimated at several millions of degrees, had completely vapourized the tower. In its place was a huge, saucershaped crater about a half mile in diameter and 25 ft. deep, the floor of which consisted of jade and turquoise coloured glass formed by the fusion of the sand.

Hiroshima and Nagasaki.—The first atomic bomb used in warfare was dropped on Hiroshima (q.v.), a Japanese army base and city of 343,000 inhabitants, at 9:15 A.M., Aug. 6 (Japanese time), 1945. The bomb was dropped from a B-29 Superfortress, the "Enola Gay." Col. Paul W. Tibbets, Jr., was the pilot and Maj. Thomas W. Ferebee the bombardier. Capt. Parsons, who had helped design the bomb, went along as the "weaponeer." The flash of the explosion was seen by a reconnaissance plane 170 mi. away. Those in the "Enola Gay" reported that a black cloud rose over Hiroshima to a height of 40,000 ft. Aerial photographs taken after the smoke and dust had cleared away showed a scene of destruction unlike any before witnessed. The entire business section at the centre of the town had disappeared except for the skeletons of three concrete buildings.

The second bomb to be used against Japan was dropped on Nagasaki at 12:01 P.M., Aug. 9 (Japanese time), from a B-29 Superfortress, the "Great Artiste," piloted by Maj. Charles W. Sweeney. It was said that the construction of this bomb was so superior that it rendered the Hiroshima model obsolete. It was first reported that the Nagasaki bomb had created a considerable crater, but later investigations showed that this report was wrong and stemmed from the existence of a crater previously caused by a bomb using T.N.T.

On June 30, 1946, the U.S. war department made public the results of the official investigation of the bombing of Hiroshima and Nagasaki. The report had been compiled by engineers and scientists of the Manhattan project who had access also to data assembled by the U.S. strategic bombing survey, the British mission to Japan and the joint atomic bomb investigating group (medical).

This report stated that Hiroshima suffered 135,000 casualties or more than half of its population. Nearly half, or 66,000, of the casualties were deaths. The greatest number of these occurred immediately after the bombing.

Nagasaki, a city of 195,000, suffered 64,000 casualties, according to this report, of which 39,000 were deaths.

The effects of the atomic bombs on human beings were of three main types, the report stated: (1) burns, including "flash" burns caused by the instantaneous heat and light radiations; (2) mechanical injuries, resulting from flying debris, falling buildings and blast effects; (3) radiation injuries caused entirely by gamma 1 ays and neutrons emitted at the instant of explosion and similar to the results of severe X-ray overexposure. The wide ground area over which burns were inflicted was particularly remarkable.

Burns caused about 60% of the deaths in Hiroshima and about 80% in Nagasaki. Falling debris and flying glass caused 30% of the deaths in Hiroshima and 14% in Nagasaki. Radiation caused 10% of the deaths in Hiroshima and 6% in Nagasaki. No harmful amounts of persistent radioactivity were found in either of the two cities.

The investigators were convinced that the destruction at both Hiroshima and Nagasaki was such as to justify the original statement that the general effect of the atomic bomb would be equivalent to an explosion of 20,000 tons of T.N.T. They also reported that the heights at which the bombs exploded were such as to have caused the maximum damage; any other bursting point for either bomb would not have been as effective. This was a tribute to the experts who had decided upon the bursting point from theoretical considerations.

In Hiroshima almost everything up to about one mile from the point on the ground directly below the burst was completely destroyed except for the buildings of reinforced concrete. In them, however, the interiors were gutted and doors, sashes, frames and all windows were ripped out. More than 60,000 of the estimated 90,000 buildings in the city were destroyed or severely damaged. In Nagasaki, reinforced concrete buildings with 10-in. walls and 6-in. floors, situated 2,000 ft. from the point on the ground below the bomb burst, collapsed. At the same distance, some 9-in. concrete walls were completely destroyed.

Philip Morrison, later professor of physics at Cornell university and one of the scientists who worked on the bomb, went to Japan at the request of the war department to visit Hiroshima and study the effect of the atomic bomb. He said that the bomb was "pre eminently the weapon of saturation," destroying so large an area so completely and so suddenly that the defense was overwhelmed. The bomb knocked out 27 of the 33 modern fire stations in Hiroshima, killing or severely injuring three-fourths of the firefighting personnel. At the same time, hundreds of fires were started. Of 298 registered physicians, only 30 escaped injury and were able to care for the survivors. Only 600 of the city's 2,400 nurses and orderlies escaped injury. Every hospital but one was badly damaged; electric power plants, railroads, telephones and telegraph lines were all put out of commission. Every citizen of Hiroshima had believed that the bomb had exploded over his own house.

Eyewitness Account.—Survivors of the bombings of the two Japanese cities told stories that would have seemed incredible and fantastic under any other circumstances. One of the most graphic came from the Rev. John A. Siemes, professor of modern philosophy in Tokyo's Catholic university. On the morning of the bombing he was sitting in his room at the Novittate of the Society of Jesus in Negatsuke, about a mile and a half from Hiroshima, halfway up the side of a broad valley. He had a view of the city from his window.

Suddenly the whole valley seemed filled with a garish light like that of a magnesium flare. At the same time, Father Siemes felt a wave of heat. A moment later there was the sound of an explosion and a blast wave which smashed his window, forcing the entire window frame out of the wall and showering him with glass. He had the feeling that a bomb had exploded directly overhead. He found every window in the building broken and his colleagues, like himself, bleeding from cuts on the hands and the face.

Rushing outdoors, they were amazed to see no bomb crater or other evidence of a nearby hit. Half a mile down the valley a group of peasant homes were on fire and the woods on the opposite side of the valley were also aflame. Father Siemes and some of the others went to the aid of the peasants whose houses were burning. They noted clouds of smoke arising over Hiroshima.

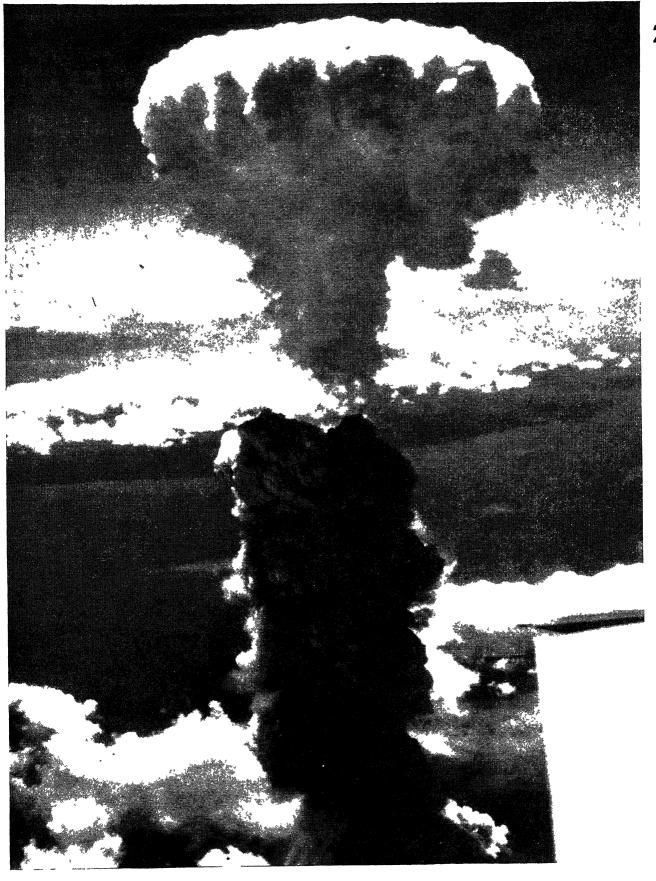
About a half-hour after the explosion, a procession of people began to stream up from the valley. The less severely injured carried or dragged the more seriously wounded. Some displayed horrible wounds of the extremities or back. There were mothers, themselves burned, carrying children with bad burns. These wounded came from the outskirts of the city. They too reported the bright light, the rush of heat, the sound of the explosion. Then, in many cases, their houses collapsed. The stream of injured grew ever greater, and by noon word came that the explosion had destroyed the entire city and that fires were raging everywhere.

Late in the day, Father Siemes and six of his colleagues went to the city on a rescue mission. The closer they got to the city, the more terrifying it appeared. The heart of Hiroshima was a gigantic burnt-out scar. They made their way along a street on the river bank among the smoking ruins and twice were forced to take refuge in the river because of smoke and flames. Everywhere they came upon the dead and the dying. Every wounded man told of relatives who had been killed. Rescue work and medical aid were virtually nonexistent in the burning city until 30 hr. after the bomb burst. (D. Dz.)

The Problem of Control

Until 1945, no individuals or groups of individuals in the U.S. were charged with the responsibility of studying the implications to society of atomic energy developments. Some thinking was done, but it was done solely on the personal initiative of a few individuals and it resulted only in the distribution of a few scattered memoranda among a limited number of Manhattan project personnel. Security regulations made difficult the exchange of ideas and viewpoints concerning the eventual repercussions of the new development, and in addition effectively prevented any study by trained economists, political scientists and sociologists.

Intimate knowledge of atomic energy developments



within the U.S. was confined, until 1945, to three main groups of persons: key military personnel of the Manhattan District, corps of engineers; industrial leaders and engineers, charged with the responsibility of designing, constructing and operating atomic bomb plants; and scientists, charged with the responsibility of conceiving, developing and improving processes for manufacturing atomic bombs.

Intimate knowledge of atomic energy developments, and for that matter even broad general knowledge of those developments, was essentially nonexistent outside those groups. The president of the U.S., the secy. of war and a few high-ranking military and naval officials knew of the developments in a broad sense. However, evidence indicated that other government departments, e.g. the state department, knew little if anything about the developments until 1945.

Thus, at the close of 1944, only six months before the first atomic bomb was exploded on the New Mexico desert, the U.S. government had no long-range plans concerning atomic energy. With the exception of the president, and possibly a few close advisers, those who were in a position to make long-range plans knew nothing about atomic energy developments. Those who were well acquainted with atomic energy were in no position to make plans, and because of the intense pressure of the work, they were in no position to make recommendations.

During the last few months of 1944 and in early 1945, with the plants at Oak Ridge, Tenn., and Hanford operating successfully, the scientists connected with the various projects were able to devote more time to considerations concerning the implications of the development.

The first major recommendation concerning U.S. policy on atomic energy, was in the form of a memorandum signed by the key scientists at the Metallurgical laboratories of the University of Chicago, and sent to the president. The memorandum, written in the early spring of 1945, recommended that immediate steps be taken to inform the American people of the new development. It was suggested that, with Germany defeated, the U.S. would not endanger itself by releasing non-technical information. It was further suggested that there would be much to be gained by having a well-informed public opinion in the U.S., at a time when the foundations for world peace were being laid.

In April Pres. Roosevelt died. Pres. Truman, as a U.S. senator, had been aware of the project, but was unfamiliar with the detailed picture. Immediately after the inauguration he was given details concerning the project by the secy. of war and Gen. Groves.

In May, Henry Stimson, the secy. of war, with the knowledge of Pres. Truman, appointed an "Interim committee" and charged it with the responsibility of formulating recommendations to the president concerning the postwar organization that should be established to direct and control the future course of the U.S. in this field. The recommendations were to cover both the research and developmental aspects of the field, and its military applications. In addition, the committee was charged with the responsibility of making recommendations with regard to the problems of both national and international control.

The Interim committee consisted of the secy. of war as chairman; James F. Byrnes, secy. of state; Ralph A. Bard, former undersecy. of the navy; William L. Clayton, assistant secy. of state; Vannevar Bush, director of the OSRD; James B. Conant, chairman of the National Defense Re-

search committee and pres. of Harvard university; Karl Compton, pres. of the Massachusetts Institute of Technology; and George L. Harrison, pres. of the New York Life Insurance company. The committee received the advice of a scientific panel consisting of physicists J. R. Oppenheimer, E. O. Lawrence, A. H. Compton and Enrico Fermi.

The Interim committee undertook an extensive investigation of the possible applications of atomic energy, and of the special problems created by the atomic bomb. A substantial fraction of the efforts of the committee was devoted to the preparation of recommendations for domestic control.

The Metallurgical laboratory at the University of Chicago was officially asked to submit its viewpoints on the social and political implications of atomic energy. Accordingly, the director of the laboratory, A. H. Compton, one of the scientific advisers to the Interim committee, appointed a committee of scientists composed of James Franck, chairman; T. R. Hogness; D. Hughes; J. Nickson; G. T. Seaborg; J. Stearns; and L. Szilard to study the matter. On June 11, 1945, that committee submitted to the secy. of war a notable report, an abbreviated summary of which follows:

The development of nuclear power not only constitutes an important addition to the technological and military power of the United States, but also creates grave political and economic problems for the future of this country.

Nuclear bombs cannot possibly remain a "secret weapon" at the exclusive disposal of this country for more than a few

Unless an effective international control of nuclear explosives is instituted, a race for nuclear armaments is certain to ensue. . . . In the war to which such an armaments race is likely to lead, the United States, with its agglomeration of population and industry in comparatively few metropolitan districts, will be at a disadvantage. . . .

We believe that these considerations make the use of nuclear bombs for an early unannounced attack against Japan inadvisable. If the United States were to be the first to release this new means of indiscriminate destruction upon mankind, she would sacrifice public support throughout the world, precipitate the race for armaments, and prejudice the possibility of reaching an international agreement on the future control of such weapons.

Much more favorable conditions for the eventual achievement of such an agreement could be created if nuclear bombs were first revealed to the world by a demonstration in an appropriately selected uninhabited area.

By the beginning of July it was believed by some of the scientists that the use of the bomb against Japan would be examined by the Interim committee primarily on the basis of expediency. With that possibility in mind, a petition was drafted by Szilard and sent directly to the president of the U.S. The petition urged the president to rule that the U.S. would not resort to the use of atomic bombs in the war unless the terms to be imposed upon Japan were made public in detail and Japan, knowing those terms, refused to surrender. The petition was signed by 67 scientists.

On Aug. 6, 1945, Hiroshima was destroyed by the new weapon. A few hours later, Pres. Truman gave the world the first official indication of U.S. policy. He stated in part:

.... We are now prepared to obliterate more rapidly and completely every productive enterprise the Japanese have above ground in any city.... Let there be no mistake; we shall completely destroy Japan's power to make war.

completely destroy Japan's power to make war...

It has never been the habit of the scientists of this country or the policy of this Government to withhold from the world

scientific knowledge. . . .

But under present circumstances it is not intended to divulge the terminal processes of production or all the military applications, pending further examination of possible methods of protecting us and the rest of the world from the danger of sudden destruction. I shall recommend that the Congress of the United States consider promptly the establishment of an appropriate commission to control the production and use of atomic power within the United States. . . .

A few days later on Aug. 10 Pres. Truman stated:

Having found the bomb, we have used it. We have used it against those who attacked us without warning at Pearl Harbor, against those who have starved and beaten and executed American prisoners of war, against those who have abandoned all pretense of obeying international laws of warfare. We have used it in order to shorten the agony of war, in order to save the lives of thousands and thousands of young Americans.

We shall continue to use it until we completely destroy Japan's power to make war. Only a Japanese surrender will

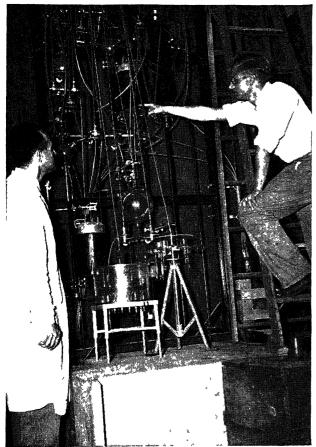
stop us.

The atomic bomb is too dangerous to be loose in a lawless world. That is why Great Britain and the United States, who have the secret of its production, do not intend to reveal the secret until means have been found to control the bomb so as to protect ourselves and the rest of the world from the danger of total destruction. . . .

Pres. Truman then made public the existence of the Interim committee under the chairmanship of the secy. of war, and he stated that Secy. of State Byrnes served on the committee as his personal representative, aiding in the preparation of plans for the future control of atomic energy.

Pres. Truman's statement precipitated considerable discussion in the U.S. and England on the question of atomic bomb secrecy. Immediately opinions were expressed in those two countries denying that secrecy could be long maintained. However, a few days later, Prime Minister

Chemical separation unit for preparing pure fission products at the Clinton laboratories, Oak Ridge, Tenn. All movement of parts and material are operated by remote control



Attlee and Winston Churchill pledged British secrecy on the bomb. In this respect at least, the policy of Great Britain supported that of the U.S.

Through Aug. and Sept. 1945 the controversy over secrecy continued. Other features of atomic warfare entered the discussions, such as questions of defense against atomic attack, and the meaning of supremacy in atomic warfare. In late September the scientists, who had been relatively silent until that time, made public statements expressing their viewpoints on the issues under discussion. The scientists stated in effect: (1) the U.S. could not expect to maintain an enduring monopoly of atomic weapons; (2) scientists could offer no hope for a specific defense against atomic bombs; (3) when other nations possessed atomic bombs, supremacy in atomic warfare would have little, if any, significance; (4) major adjustments should be made in the relationships between nations, if civilization was to survive.

Meanwhile, by the end of Sept. 1945, the Interim committee, working with the war department and the advisory panels, had prepared legislation for the control of all sources of atomic energy and activities connected with its development and use in the U.S. On Oct. 3 Pres. Truman sent a message to the senate urging the creation of legislation to establish an Atomic Energy commission, and on the same day the Interim committee proposals were introduced simultaneously in the house of representatives and senate by Rep. Andrew J. May (Democrat, Ky.) and Sen. Edwin C. Johnson (Democrat, Colo.).

May-Johnson Bill.—In his Oct. 3 message to the senate, Pres. Truman pointed out that the U.S. should proceed along two fronts of atomic energy control—the domestic and the international. He stressed that the first and most urgent step should be the determination of domestic policy, and he outlined the general features of the legislation that would be required. Concerning the international aspects, he said:

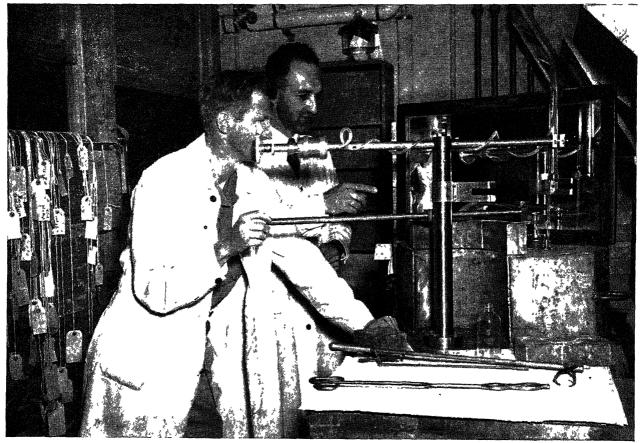
In international relations as in domestic affairs, the release of atomic energy constitutes a new force too revolutionary to consider in the framework of old ideas. We can no longer rely on the slow progress of time to develop a program of control among nations. . . .

Scientific opinion appears to be practically unanimous that the essential theoretical knowledge upon which the discovery is based is already widely known. There is also substantial agreement that foreign research can come abreast of our present theoretical knowledge in time.

The hope of civilization lies in international arrangements of the atomic bomb, and encouraging the use of atomic energy and all future scientific information toward peaceful and humanitarian ends. . . . Discussion of the international problem cannot be safely delayed until the United Nations organization is functioning and in a position adequately to deal with it.

I therefore propose to initiate discussions, first with our associates in this discovery, Great Britain and Canada, and then with other nations, in an effort to effect agreement on the conditions under which cooperation might replace rivalry in the field of atomic power. . . .

In the house of representatives, the May-Johnson bill was referred to the House Military Affairs committee. Hearings on the bill were held on Oct. 9 and, after one day, were closed. Almost immediately there arose considerable objection to the procedure that had been used, it being believed in some quarters that such an important bill should be discussed more fully before being released from the committee. As a result of those objections, hearings were reopened for an additional day on Oct. 18. After amendment by the Military Affairs committee, the bill was reported out as H.R. 4566.



Safety device for remote manipulation of radioactive material at the Oak Ridge atomic bomb plant in Tennessee. At a safe distance, and with the aid of a mirror, technicians are able to open a bottle imbedded in a heavy lead block

Considerable opposition to the May-Johnson bill developed after the hearings. Some of the more serious objections brought forth were as follows:

- 1. The bill would create a nine-man commission, all members serving on a part-time basis. Opponents of the bill believed that all commission members should serve full time.
- 2. The bill would permit all commission members to be members of the armed forces. Opponents of the bill believed that the commission should be predominantly civilian.
- 3. Opponents of the bill believed that the commission's powers as outlined were too broad. The bill delegated to the commission the authority of formulating and enforcing all national policy on atomic energy. The commission would not be responsible in the making or enforcement of policy to the president or any other authority. The commission would be virtually immune from outside criticism or review.
- 4. The commission would have full authority to issue restrictive regulations, over and above the U.S. Espionage act, on the dissemination of scientific information. In addition, the tommission could direct the dismissal of any employee of the commission, or contractor, from public or private employment, at the commission's pleasure, without regard to criminal prosecution or conviction.
- 5. The commission could manufacture atomic bombs as it alone might see fit, or it could authorize the manufacture of atomic bombs by the military or by private concerns.
 - 6. The bill contained no specific provision for the cus-

tody of atomic bombs. Either the commission or the armed forces could have sole custody.

- 7. The bill would direct the commission to conduct research for the exploitation of atomic energy for military purposes, with no reference being made to international agreement.
- 8. The bill created a full-time administrator, responsible to the commission, but delegated powers fully as broad as those of the commission. Opponents of the bill feared that the administrator might, in effect, determine the policy of the commission.

As a result of the widespread objections to the May-Johnson bill, on Oct. 29, 1945, the U.S. senate adopted a resolution establishing a Special Committee on Atomic Energy. The resolution directed the president pro tempore of the senate to appoint an 11-man committee, directed "to make a full, complete, and continuing study and investigation with respect to problems relating to the development, use, and control of atomic energy." The resolution specified that all bills and resolutions relating to atomic energy, should be referred to the special committee.

Shortly after the authorization of the Special Committee on Atomic Energy, the membership of the committee was announced: Brien McMahon (chairman), Warren R. Austin, Harry Flood Byrd, Tom Connally, Thomas C. Hart, Bourke B. Hickenlooper, Edwin C. Johnson, Eugene D. Millikin, Richard B. Russell, Millard E. Tydings and Arthur H. Vandenberg. The committee visited the atomic energy development at Oak Ridge, following which, on Nov. 27, 1945, it started extensive hearings.

Truman-Attlee-King Statement.—Meanwhile, the first official statement of combined U.S. British-Canadian policy on the international control of atomic energy was issued

on Nov. 15, 1945, after a conference between Pres. Truman, Prime Minister Clement R. Attlee of the United Kingdom and Prime Minister Mackenzie King of Canada. The three powers recommended that, at the earliest practicable date, a commission should be established under the United Nations to prepare recommendations on atomic energy. They stated that in particular the commission should make specific proposals for extending between nations the exchange of basic scientific information for peaceful ends, and proposals for establishing controls and safeguards providing for the elimination from national armaments of atomic weapons and other major weapons adaptable to mass destruction.

The Truman-Attlee-King statement officially acknowledged that no monopoly of atomic power could exist, that there was no defense against the atomic bomb and that other and more deadly atomic weapons were possible. The statement was the first acknowledgment by any of the three governments that safeguards involving inspections were essential to any successful banning of atomic bombs. The three powers emphasized that they were prepared to share, on a reciprocal basis with others of the United Nations, detailed information concerning the practical industrial application of atomic energy just as soon as effective enforceable safeguards against its use for destructive purposes could be devised.

In conclusion, the three powers stated:

Faced with the terrible realities of the application of science to destruction, every nation will realize more urgently than before the overwhelming need to maintain the rule of law among nations and to banish the scourge of war from the earth. . . . It is our firm resolve to work without reservation to achieve these ends.

Moscow Resolution.—The U.S.-British-Canadian conference in November was followed by discussions between Foreign Ministers Bevin and Molotov and Secy. of State Byrnes at the Moscow conference, held Dec. 16–26, 1945. A resolution was drawn up to be sponsored by the permanent members of the Security council plus Canada, to be introduced at the first session of the general assembly. Briefly, the resolution stated that an atomic energy commission should be established by the general assembly. The commission should be composed of one representative from each of the states represented on the Security council, and Canada. The commission should submit its reports and recommendations to the Security council.

The specific tasks of the commission were enumerated by the Moscow resolution in exactly the same language and order employed in the Truman-Attlee-King statement. It was emphasized that the work of the commission should proceed by separate stages, the successful completion of each one of which would develop the necessary confidence of the world before the next stage would be undertaken.

After the Moscow conference there was considerable discussion of the proposals, particularly in the U.S. It was feared, in some quarters, that the U.S. had committed itself to reveal some of its atomic energy information, without at the same time being provided with the necessary safeguards. On his return from Moscow, Secy. of State Byrnes stated, in a radio address delivered on Dec. 30, 1945:

The British and ourselves came to Moscow with a very definite proposal for the establishment by the United Nations of a commission on atomic energy and related matters, based on the Washington declaration of the President of the United States and the Prime Ministers of Great Britain and Canada... Our discussions were limited to this proposal. At no time did we discuss any technical or scientific matters... I was happy to find that the Soviet Government feels as we do that this particular weapon is of such a revolutionary nature that

we should explore through a United Nations commission methods of international control.

It should be understood that the task of the commission is to inquire into the problems raised by the discovery of atomic energy and related matters and to make recommendations. Neither the Security Council nor the commission has authority to bind any Government to act on its recommendations. . . .

Neither we nor any other nation would be expected to share our annament secrets until it was certain that effective safeguards had been developed to insure our mutual protection....

On Jan. 7, 1946, Secy. Byrnes issued a further statement concerning the Moscow resolution. He said that he did not see how the language used in the resolution "can possibly be construed to give the commission authority to obtain information which is not publicly available or which is not voluntarily given to it," and added that the language of the resolution made clear that the proposed commission would have authority only to make recommendations. He pointed out that unless the U.S. concurred in the recommendation, it could not be adopted. If the U.S. concurred and the Security council adopted the recommendation, it would still be for the government of the U.S. by treaty or by congressional action to determine to what extent that recommendation should be acted upon.

The United Nations general assembly, at its first meeting on Jan. 13, 1946, referred the Moscow resolution to the Security and Political committee of the assembly. The committee recommended the adoption of the resolution without changes. On Jan. 24 the assembly voted 47 to 0 to set up the 12-nation commission.

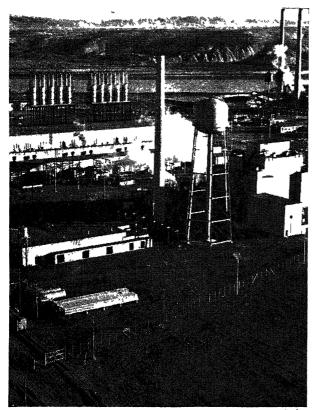
McMahon Bill.—Meanwhile, by the end of 1945, the Senate Committee on Atomic Energy had heard testimony from 22 persons including 1 economist, 1 army officer, 4 naval officers, 12 scientists and 4 industrialists. On Dec. 20, 1945, Sen. Brien McMahon (Democrat, Conn.), chairman of the committee, introduced into the senate a bill entitled the "Atomic Energy Act of 1946." The bill was referred to the committee, and during the months January—April inclusive, testimony was heard from an additional 49 individuals. After the hearings on the bill, the committee went into executive session, during which initial differences of opinion on major elements of the bill were resolved.

Perhaps the most serious debate in the senate committee occurred over the question as to whether civilians or military men should wield the most power on the proposed Atomic Energy commission. Opinions varied from the desire on the part of some for a commission dominated completely by the army and navy, to the desire on the part of others for a commission with no military representation whatsoever.

Secy. of War Robert P. Patterson expressed himself in favour of civilian control of atomic energy by endorsing a full-time, three-man civilian commission. He stated that in his opinion, the army was not competent to draw the line between basic scientific research and military techniques which should be kept secret. Secy. Patterson did, however, suggest amendments to the McMahon bill which would give the armed forces the right to conduct military research in the field of atomic power, to have the custody of atomic bombs and to be consulted on security regulations.

Gen. Groves urged, on the other hand, that the legislation provide for a part-time nine-man Atomic Energy commission containing up to four military men. He urged that a military officer on active duty be the administrator.

Considerable opposition developed to the viewpoint expressed by Gen. Groves, as well as to the less military



Richland, Wash., site of the Hanford Engineer works, one of the three U.S. atomic bomb plants erected during World War II. This picture shows a partial view of one production unit on the 450,000acre government tract

viewpoint expressed by Secy. Patterson. Considerable public debate developed, and the senate committee had difficulty in arriving at an agreement.

On March 12, 1946, the senate committee accepted by a vote of ten to one a compromise proposal of Sen. Vandenberg:

There shall be a Military Liaison Board appointed by the President composed of representatives of the Departments of War and Navy, in such a number as the President may determine. The commission shall advise and consult with the board on all atomic energy matters which the board deems to relate to the common defense and security. The board shall have full opportunity to acquaint itself with all matters before the commission.

The board shall have authority to make written recommendations to the commission from time to time as it may deem appropriate. If the board at any time concludes that any action or proposed action of the commission, or failure to act by the commission, is inimical to the common defense and security, the board may appeal such actions or proposed actions of the commission to the President, whose decisions shall be final.

Sen. Vandenberg claimed that his amendment would leave all power with the five-man civilian commission as proposed in the original bill, and would allow the military to interfere only when it might believe that the interests of national defense were threatened by action (or inaction) of the commission. Opponents of the amendment claimed that it would give the military the right and the duty to impose the military concept of security upon as wide an area of fundamental research as possible. It was believed by the opponents of the amendment that the military advisory board would attempt a continuation of the Manhattan District policy of secrecy and compartmentalization.

The fight over the Vandenberg amendment rapidly assumed the character of a major national issue. Finally, on April 2, a modified version of the Vandenberg amend-

ment was introduced and adopted unanimously by the senate committee. The changed version in effect provided for a military liaison board, but with powers greatly reduced below those provided by the original amendment.

On April 11, 1946, the revised Atomic Energy Act of 1946, changed in many respects from the original bill which had been introduced by Sen. McMahon the previous December, was reported out of committee. No action was taken by the senate until June 1, at which time the bill was passed by voice vote, almost without debate.

In the house of representatives, the bill was referred to the Military Affairs committee. On June 18 and 19, the Military Affairs committee amended the bill (1) to provide for the inclusion of two military men in the proposed five-member commission; (2) to specify that the director of the division of military application should be a member of the armed forces; and (3) to permit the army, with presidential authority, to manufacture atomic bombs.

It was quickly realized that if the amendments proposed by the Military Affairs committee remained, there would be very little chance of the revised bill passing the senate before the summer recess. In addition, public debate over the issues involved was increasing rapidly. As a result, a joint house-senate committee was given the task of resolving the differences between the two houses. The joint committee deleted the amendment providing for the inclusion of two military men in the commission, but retained the amendment requiring that the director of the division of military application be a member of the armed forces. In addition, the amendment permitting the army, with presidential authority, to manufacture atomic bombs was retained.

Finally, on Aug. 1, 1946, the Atomic Energy Act of 1946 was passed by both houses as amended. The bill was by no means completely satisfactory to all parties concerned. The provisions covering security, punishments for violations and patents were still the subjects for considerable debate even at the time of passage. However, it did give the U.S. a sufficiently concrete proposal to enable steps to be taken for the organization of controls and developmental research looking forward to the application of the new field to peaceful pursuits. (H. S. B.)

Atomic Energy Commission.—On Oct. 28, 1946, the membership of the Atomic Energy commission authorized by passage of the McMahon bill was announced. As chairman of the commission Pres. Truman appointed David E. Lilienthal, who had made a distinguished record as chairman of the Tennessee Valley authority. The other members appointed were Robert Fox Bacher, Cornell university physicist who had worked in the Los Alamos atomic bomb laboratory and later served as scientific adviser to Bernard M. Baruch, U.S. representative on the United Nations Atomic Energy commission; Sumner T. Pike of Maine, business man and former member of the Securities and Exchange commission; Lewis L. Strauss, New York banker and a rear admiral during World War II in charge of ordnance inspection; and William Wesley Waymack of Illinois, newspaper editor, Pulitzer prize winner and an economic and fiscal adviser to various government agencies in World War II.

On Nov. 4 Secy. of War Patterson and Secy. of the Navy Forrestal announced the appointment of the six-man Military Liaison committee to the Atomic Energy commission. The army membership was headed by Lieut. Gen. Lewis H. Brereton, wartime chief of the far east 9th and 10th air forces. The other army members were Maj. Gen. Lunsford E. Oliver of the army ground forces and Col. John H. Hinds, a field artilleryman who had held the wartime rank

of brigadier general. Heading the navy membership was Rear Adm. Thorvald A. Solberg, head of the research and standards branch of the shipbuilding division of the bureau of ships. He had also served as director of ship matériel at the Bikini atomic bomb tests. Other members representing the navy were Rear Adm. Ralph A. Ofstie, a naval aviator who served as aviator officer on Adm. Nimitz's staff and later commanded the U.S.S. "Essex," and Rear Adm. William S. Parsons, who had helped develop the atomic bomb, flew in the B-29 which dropped the atomic bomb on Hiroshima, and was deputy commander for technical direction at Bikini.

On Dec. 12, 1946, Pres. Truman appointed a nine-man General Advisory committee to the Atomic Energy commission, as authorized by the McMahon bill to consult with the commission on "scientific and technical matters relating to materials, production and research, and development." It consisted of James B. Conant, president of Harvard university; Lee A. du Bridge, president of the California Institute of Technology; Enrico Fermi, professor of physics in the University of Chicago; I. I. Rabi, professor of physics in Columbia university; J. R. Oppenheimer, of the University of California, wartime director of the Los Alamos laboratories of the Manhattan project; Glenn T. Seaborg, professor of chemistry in the University of California; C. S. Smith, director of the institute of metals in the University of Chicago; Hartley Rowe, vice-pres. and chief engineer of the United Fruit Co.; and Hood Worthington, chemical engineer with E. I. du Pont de Nemours and Co.

Following a series of conferences with members of the war department, the Atomic Energy commission announced on Dec. 11, 1946, that it would assume formal control of the Manhattan Engineer District—a plant valued at \$1,400,000,000, with approximately 43,000 employees.

Plans for Research.—During 1946, the Manhattan District took a number of important steps to further research in the field of atomic energy. On Aug. 2 Maj. Gen. Groves announced that Camp Upton, N.Y., had been transferred to the Manhattan District and would be made the site of an atomic research laboratory. It was later named the Brookhaven National laboratory, and Philip M. Morse, of Massachusetts Institute of Technology, was appointed its director. The contract for its operation was given to Associated Universities, Inc., a corporation formed for this purpose by Columbia, Cornell, Harvard, Johns Hopkins, Massachusetts Institute of Technology, Pennsylvania, Princeton, Rochester and Yale. It was planned to install research facilities costing \$5,000,000.

The General Electric Co., which on Sept. 1, 1946, had taken over operation of the \$347,000,000 government-owned Hanford Engineer Works, established a laboratory at that location under the direction of William D. Coolidge.

On Oct. 7, 1946, a training school in nuclear physics was opened at the Clinton laboratories at Oak Ridge, Tenn., with a class of 35 students from leading industrial and academic institutions of the nation. The plan was to give them a 12-month post-doctorate course in nuclear physics. Opportunity was provided for research in the field of designing uranium piles for peacetime applications.

Plans were also made for the construction of a \$2,500,000 uranium pile at Oak Ridge for experiments in the development of electric power through atomic energy. The contract for this pile was given to Monsanto Chemical Co., operators of the Clinton laboratories. The Manhattan District also ordered a 100,000,000-volt betatron from the General Electric Co. for use at the Clinton laboratories.

The name of the Metallurgical laboratory at the Uni-

versity of Chicago was changed to the Argonne National laboratory, and its program was expanded to include researches at a considerable number of other universities.

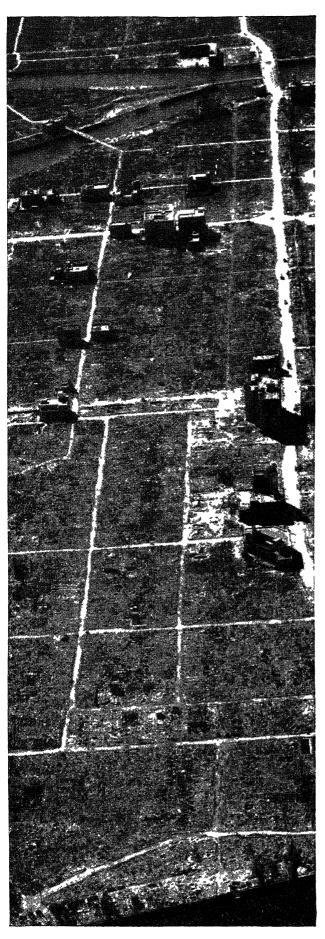
On Nov. 10, 1946, the war department announced plans for a nuclear research laboratory near Schenectady, N.Y., to cost \$20,000,000 and to be known as the Knolls Atomic Power laboratory. The contract for its design, construction and operation was awarded to the General Electric Co. Plans included the establishment of an experimental uranium pile to be used as the source of energy for an electric power plant. The Knolls laboratory was to adjoin the new General Electric laboratory at Schenectady.

One of the important problems before the nation in 1946 was the release of some of the information on atomic research in the secret files of the Manhattan District. On Nov. 7 announcement was made that nearly 500 papers, totalling about 2,000,000 words of atomic information had been cleared through the district's "declassification" procedure. It was planned eventually to publish many of these papers in a Manhattan project technical series. The declassification policy was based on recommendations of a committee headed by Richard C. Tolman, dean of the graduate school of California Institute of Technology and including R. F. Bacher, A. H. Compton, E. O. Lawrence, J. R. Oppenheimer, F. G. Spedding, and H. C. Urey. The policy was to release scientific information to further the national welfare without endangering national security.

Medical and Biological Aspects.-The medical profession had long made use of both X-rays and radium in the treatment of many diseases, including cancer. After the discovery of artificial radioactivity there was considerable research upon the use of radioactive isotopes both as a means of treating disease and as a tool for biological and medical research. Biologists had long wished for more exact information about the various metabolic processes in the living organism and the rates at which they take place. This was being obtained with the aid of radioactive isotopes which could be traced in the organism by their radioactivity. Biologists spoke of such experiments as "tracer experiments." Radioactive forms of carbon, phosphorus, sodium, potassium, iodine, iron, etc., were used in such experiments. The importance of uranium fission to the biologist and medical man arose from the fact that the fission fragments are highly unstable, undergoing many radioactive changes before they settle down into stable isotopes. The process, therefore, would put a greater volume of radiation and a greater variety of radioactive isotopes at the command of the biologist and medical man and thus lead to many advances in biology and medicine. One hope was that a radioactive isotope might be found as a specific for cancer tissue; that is, an isotope which when taken into the organism would settle only in cancer tissue.

The first delivery of radioactive isotopes to the nation's medical research institutions—pea-sized units of Carbon 14—was announced by the Manhattan District on Aug. 2, 1946. Barnard Free Skin and Cancer hospital of St. Louis received the first unit for use in cancer research. This small bit of Carbon 14 represented from 100 to 1,000 times as much of the isotope as had ever been made available previously by any single order for a cyclotron-produced isotope. Similar amounts of the isotope were subsequently furnished to a number of other institutions.

Radioactive isotopes were requested from the Manhattan District for a wide variety of researches. The subjects



included the mechanism by which cancer is produced, mechanisms by which plants utilize sunlight and carbon dioxide, disfunction of the thyroid glands, growth and composition of teeth and bones, utilization of sugar in diabetes, utilization of all essential food components, turnover of iron in anaemic conditions, absorption by plants of essential elements from the soil, vulcanization and polymerization of rubber and problems associated with radioactive isotopes themselves.

The U.S. public health service joined the program of the Clinton laboratories at Oak Ridge on Nov. 5, 1946, with the announcement of the formation of a new division in the National Institute of Health. Alexander Hollaender, principal biophysicist of the institute, was assigned to Oak Ridge to direct a research into the effect of nuclear radiation upon living cells. The work was divided into five general fields—biochemistry, cytogenetics, general physiology, experimental radiology and co-operative studies.

International Problem

In his message to congress on Oct. 3, 1945, Pres. Truman had called attention to the necessity of international action in the field of atomic energy and declared his intention of conferring with the British and Canadian governments. Prime Minister Attlee arrived in Washington, D.C., on Nov. 11, 1945, for a conference with Pres. Truman and Prime Minister Mackenzie King.

In a joint statement on Nov. 15, the three heads of government expressed their willingness to share, on a reciprocal basis with other members of the United Nations, the practical applications of atomic energy "just as soon as effective safeguards against its use for destructive purposes can be devised." (See "Truman-Attlee-King statement," above.)

Diplomats eagerly awaited the soviet reaction to the Truman-Attlee-King statement. The U.S. Daily Worker, which had often reflected accurately official Moscow opinion, called the agreement a blackjack with which the U.S. and Great Britain sought to bludgeon the U.S.S.R. into their way of thinking on international issues. Secy. of State Byrnes denied any such attempt upon the part of the U.S. in an address in Charleston, S.C., on Nov. 16.

The atmosphere was cleared for the time being by the issuance on Dec. 27 of the text of an agreement reached by the foreign ministers of the U.S., Great Britain and soviet Russia meeting in Moscow. This agreement contained, along with other matters, a resolution (see above) to be proposed to the general assembly of the United Nations for the creation of an Atomic Energy commission to deal with the four points set forth in the Truman-Attlee-King agreement.

On Jan. 24, 1946, the general assembly of the United Nations, meeting in London, unanimously adopted the resolution proposed by the foreign ministers at Moscow for the creation of an Atomic Energy commission. Secy. of State Byrnes hailed the event as a means of avoiding an international armaments race. Its immediate adoption had been urged by Andrei Y. Vishinsky, the soviet deputy foreign commissar.

Twelve nations were accorded representation on the Atomic Energy commission. They were the U.S., U.S.S.R., Great Britain, France, China, Canada, Australia, Poland, the Netherlands, Mexico, Egypt and Brazil. Some of these nations delayed appointing their representatives to

Aerial view of Hiroshima after it had been levelled by a single atomic bomb in Aug. 1945. This section was once a congested area of factories and houses the commission in the succeeding months and on April 6, Trygve Lie, secretary general of the United Nations, issued a statement pointing out the urgency of the situation and urging the nations to hurry with their appointments.

Acheson-Lilienthal Report.—On March 28, 1946, the U.S. state department made public its "Report on the International Control of Atomic Energy," known also as the Acheson-Lilienthal or the Lilienthal report. It was drawn up for the state department's committee on atomic energy, of which Dean Acheson, undersecretary of state, was chairman, by a board of consultants headed by David E. Lilienthal who, at the time, was chairman of the Tennessee Valley authority.

The members of the Lilienthal's board of consultants were J. Robert Oppenheimer; Charles Allen Thomas, vice-pres. and technical director of the Monsanto Chemical Co.; Harry A. Winne, vice-pres. in charge of engineering of the General Electric Co.; and Chester L. Barnard, pres. of the New Jersey Bell Telephone Co. Members of Acheson's committee were Vannevar Bush, James B. Conant, Maj. Gen. Leslie R. Groves and John J. McCloy, former assistant secy. of war.

One of the chief elements of every discussion of the atomic bomb on the floor of congress and elsewhere had been the question of secrecy. This was dealt with in the letter of transmittal accompanying the report, which made it clear that there would be no immediate disclosure of the nation's secret information, but that disclosures would be progressive and would keep pace with the development of the international situation.

Several stages were contemplated in the release of secret information. The first would be the release of only such information as was necessary to make clear the proposals on which world agreements could be based. The letter stated, "We estimate the degree of its importance and the effect of its disclosure to be as follows: If made known to a nation otherwise equipped by industrial development, scientific resources and possessing the necessary raw materials to develop atomic armament within five years, such disclosure might shorten that period by as much as a year."

The Acheson-Lilienthal report began with recognition of the fact that the atomic bomb had given mankind "means of destruction hitherto unknown" and that the U.S. public had reacted with expressions of horror and concern to the thought of a war fought with atomic weapons. It pointed out next that it was generally recognized that there could be no adequate military defense against atomic weapons. It further stated that there could be no lasting monopoly in atomic weapons and emphasized the fact that an atomic bomb possessed its greatest advantage as an aggressive weapon of surprise.

The report took the stand that any mere agreement to outlaw the atomic bomb was insufficient and unworkable, largely because of the fact that the development of atomic energy for peaceful purposes and the development of atomic energy for bombs were, in much of their courses, interchangeable and interdependent. Thus the only assurance that atomic plants would not be converted to destructive purposes would be the pledged word and good faith of each nation involved. This fact put an enormous pressure upon national good faith and created suspicion on the part of other nations that their neighbours' pledged word would not be kept. This danger was accentuated by the fact that the atomic bomb's greatest effectiveness lay in its use as a surprise weapon; fear of such a surprise violation of pledged word would surely break down any confidence in a mere agreement or treaty.

For this reason, the report concluded, there was no prospect of security against atomic warfare in a system of international agreements to outlaw such weapons, even though the agreement was implemented by inspection and similar police-like methods.

At the heart of the plan for the control of atomic energy proposed by the Acheson-Lilienthal report was the so-called denaturing process discovered in 1943 but never disclosed until the publication of the report. Even so, the report gave no technical details of the process, describing it only in the broadest general terms.

It appeared that both uranium 235 and plutonium could be "denatured;" that is, they could be mixed with some substance which has the effect of slowing down the rate at which nuclear fission can take place in these substances. As a result they can be used for the release of nuclear energy for industrial or experimental purposes but not for the manufacture of a bomb, for the bomb depends upon a lightning-like chain reaction in which the process of nuclear fission takes place in the entire mass of material in about one ten-millionth of a second.

The denaturants, the report stated, are so difficult to remove that plants comparable to the one at Oak Ridge would have to be built by any nation which sought to purify denatured uranium or plutonium in order to construct a bomb.

Making use of this possibility of denaturing fissionable materials, the report sought to set up a plan whereby every nation could develop the use of atomic energy to the fullest for peacetime purposes while at the same time it would be impossible for any nation to produce an atomic bomb. To accomplish this, it proposed the creation of an international Atomic Development authority or ADA.

Every nation would turn over to this ADA the ownership of its uranium deposits. Only the ADA would be permitted to mine uranium or related substances and to purify them. All plants and factories operated by the ADA would be under the jurisdiction of the United Nations and not the nation in which they were located. All uranium 235 and plutonium manufactured at these plants would be immediately denatured, and the denatured material would then be made available to the nations of the world for any peaceable purpose that they saw fit.

The plants for the separation of the fissionable materials and their subsequent denaturing would be distributed strategically throughout the world so that no one nation would contain an undue proportion. Should any nation seize an ADA plant for warlike purposes, it would be at the disadvantage of knowing that the rest of the world could immediately convert the other plants to the production of bombs. The fact that it was thus in a weak position, with the rest of the world arrayed against it, would deter any nation from such action.

It was apparent that the plan was based upon the premise that atomic energy could be brought under control by controlling uranium. Obviously the whole situation would be enormously complicated if, e.g., some scientist discovered a method of releasing atomic energy from some common substance like clay or iron. The report made it plain that no such discovery was anticipated in the near future.

The report, however, advocated that thorium as well as uranium be placed under the jurisdiction of the ADA, since thorium undergoes nuclear fission like uranium. A chain reaction cannot be maintained in thorium alone, but it can be in a mixture of uranium and thorium. By

the use of such a mixture, thorium can be converted into a dangerous fissionable material just as ordinary uranium can be converted into plutonium. Hence it was felt imperative to bring thorium as well as uranium under the control of the ADA; other chemical elements would be added to the control list only if future scientific and technical developments rendered such control advisable.

The strength of the plan proposed by the Acheson-Lilienthal report lay in the fact that it recognized the clear necessity of developing the peacetime uses of atomic energy. The report pointed out that if no attempt was made beyond outlawing the bomb and setting up an inspection system to hunt for bombs, it would be obviously difficult to recruit international enforcement officers. Such a plan might "draw the kind of men who were attracted to prohibition squads in years past."

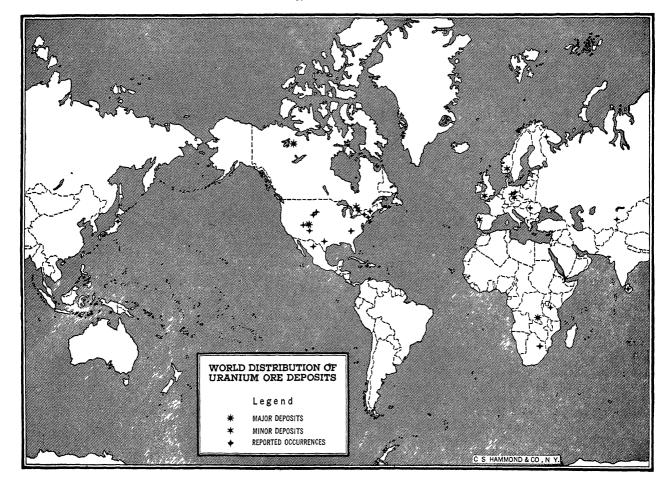
The two great fields of development envisioned by the report were the use of atomic energy as a controlled source of industrial power and the application of nuclear processes to research in medicine, biology and related fields. The plan divided all activities involving atomic energy into two categories—"safe" and "dangerous." All "dangerous" activities would be placed in the hands of the ADA. Each nation would be left free to do exactly as it pleased in the realm of "safe" activities; any activity would be regarded as dangerous if it could contribute to the manufacture of an atomic bomb.

The ADA would be truly international in character and would be set up as one of the subsidiary agencies of the United Nations, designed to be more than a body of police and detectives in the field of atomic energy. Its purpose would be dual: maintenance of world security and the prevention of the manufacture of atomic bombs, and promotion of the beneficial use of atomic energy.

The first activity of the ADA would be to bring under its control the world's entire useful sources of uranium and thorium. But it would also conduct continuous surveys for new deposits so that it would have the most complete knowledge of the world geology of these materials. In addition, it would constantly explore new methods for recovering these materials from ores in which they occurred in small quantities. The allocation of these positive duties to the ADA would, it was believed, attract geologists, engineers, physicists and chemists to it when these scientists might regard the sole duty of inspection as irksome and unattractive.

The second major function of the ADA would be the operation of all plants for the separation of uranium and thorium, the production of Uranium 235 and plutonium and the subsequent denaturing of these materials. Thus, the ADA would take over the operation of the U.S. plants at Oak Ridge and at Pasco, Wash. But as in the case of the mining operations, the ADA would be charged with the development of new and improved production methods, thus again attracting to itself many of the world's leading scientists and engineers. The ADA would even have to carry on continuous researches on atomic bombs since its function of preventing the production of bombs would require it to be the world's best-informed body on the production of such bombs.

The Baruch Proposal.—Bernard M. Baruch, America's "elder statesman," was appointed U.S. representative to the United Nations Atomic Energy commission on March 18, 1946, ten days before issuance of the Acheson-Lilien-



thal report. Baruch immediately announced the appointment of a team of "alternates and co-workers" consisting of John Hancock, Ferdinand Eberstadt, Herbert Bayard Swope and Fred Searls. He also said that he would seek the guidance of Vannevar Bush, James B. Conant, Arthur H. Compton and Maj. Gen. Groves. Because of delays in the appointment of the delegates of some nations, the United Nations Atomic Energy commission was not ready to meet until June.

On June 14, 1946, Baruch presented the "United States Atomic Energy Proposals" to the commission. These closely paralleled the Acheson-Lilienthal report but differed in some respects. They were elaborated in three official memoranda presented later to the commission, "The Control and Development of Atomic Energy" on July 2, "The Functions and Powers of the Atomic Development Authority" on July 5 and "The Relation of the ADA to Other Organs of the United Nations" on July 12.

These memoranda proposed the creation of an international Atomic Development authority to control the production and use of uranium and thorium, all fissionable materials and their products. Free access for international inspection was stipulated. There were provisions for specific punishment for illegal possession or use of atomic bombs or materials from which bombs could be made or for seizure of property belonging to the ADA or for other willful interference with activities of the ADA.

An important feature of the Baruch proposals was that no nation could be protected from punishment for violation of the proposed international control treaty through the use of the veto whether this veto was cast by the violating nation or any other nation possessing the veto power.

Andrei A. Gromyko, representative of the soviet union on the United Nations Atomic Energy commission, presented a soviet counterproposal to the commission on June 19. He stated that the continued production of atomic bombs in the U.S. was serving to intensify mistrust between nations. He proposed an international agreement to outlaw the production of atomic bombs and to provide for the destruction of all existing stocks of bombs within three months. It seemed clear that the soviet union was resisting the idea of international inspection.

The Baruch proposal was supported in principle, however, by the delegates of Australia, Brazil, Canada, China, Egypt, France and the Netherlands. Great Britain and Mexico also went along to a lesser degree. The representative of Poland urged immediate steps to outlaw the atomic bomb as proposed by the soviet delegate.

It was immediately clear that a wide gulf separated the official views of the U.S. and soviet Russia. The U.S.S.R. wanted the U.S. to stop making bombs immediately. It apparently believed that a treaty under which all nations agreed not to make bombs was sufficient to control the situation. It proposed that the treaty contain provisions for national legislation in each state for the punishment of violations of the treaty. Soviet Russia resisted any interference with its veto power, but proposed a committee of the United Nations for the exchange of scientific information and joint scientific programs for the use of atomic energy in the public welfare of all peoples.

The U.S. view, as originally set forth in the Acheson-Lilienthal report, was that a mere treaty was insufficient. An international inspection service was demanded. To this Baruch added the provisions for penalties for violation of the agreement or interference with the ADA. He also insisted that no veto apply under the ADA.

The difference of opinion was so wide that many observers feared that it might split the entire United Nations

organization. Both the U.S. and the U.S.S.R. appeared willing to negotiate but only on the basis of its own plan. As 1946 drew to a close, however, it seemed as though the tension was beginning to decrease.

The situation looked brighter in Dec. 1946 when Molotov indicated that the U.S.S.R. might decide to agree to a system of international inspection, and when the U.S.S.R made proposals on disarmament in general which the U.S. delegate to the United Nations general assembly indicated would be acceptable to the U.S. if they also were extended to include the principle of inspection.

The Bikini Tests

The U.S. navy suggested on Sept. 16, 1945, that the captured Japanese battleship, "Nagato," be used to test the effect of an atomic bomb upon a battleship. It was recalled that on July 18, 1921, a squadron of army planes under Brig. Gen. William L. (Billy) Mitchell sank the former German cruiser "Frankfurt" off the coast of Virginia, and two days later sank the former German dreadnought, "Ostfriedland." On Sept. 5, 1923, army bombers under Mitchell's direction sank the obsolete U.S. battleships, "New Jersey" and "Virginia," off Cape Hatteras.

The navy suggestion set in motion a train of events that culminated in the summer of 1946 in the atomic bomb tests at Bikini atoll in the Pacific. Soon after the navy announcement the army air forces demanded a share in the tests, and as a result it was decided on Dec. 10 to make the event a joint venture of the war and navy departments. The joint chiefs of staff created joint armynavy task force 1 and appointed Vice-Adm. William H. P. Blandy as its commander. The name "Operation Crossroads" was chosen for the tests, as Adm. Blandy told the senate special committee on atomic energy, because of its "possible significance." It was realized that seapower and airpower, perhaps civilization itself, were at the crossroads. Blandy revealed that his staff included Maj. Gen. W. E. Kepner as deputy commander for aviation; Rear Adm. W. S. Parsons, deputy commander for technical direction; Maj. Gen. Anthony C. Auliffe, army ground forces adviser; R. A. Sawyer of the Manhattan District, technical director; and Capt. J. A. Snackenberg, U.S. navy, chief of staff. Bikini atoll had been chosen as the site of the tests and three tests were contemplated. In the first, scheduled for early in May 1946, a bomb would be dropped over a target fleet from a B-29 Superfortress. In the second, scheduled for July, a bomb would be exploded just under the surface of the water. In the third, scheduled for 1947, but cancelled by Pres. Truman on Sept. 7, 1946, it was planned to explode a bomb in deep water. Admiral Blandy said that it was planned to use a large number of target ships, including battleships, aeroplane carriers, cruisers, destroyers and submarines.

Located in the Marshall Islands in the Pacific, six degrees north of the equator, the Bikini atoll was known prior to World War II as the Eschholtz atoll. It is 70 mi. east of the island of Eniwetok and about the same distance northwest of Kwajalein, an important army air force and navy base in World War II. The atoll is a coral ring of more than 20 islands, of which the principal is Bikini Island, 21½ mi. long. The lagoon inside the atoll is 20 mi. long and 12 mi. wide. Plans for Operation Crossroads made it necessary to evacuate the natives from Bikini Island, and accordingly "King" Juda and his 165 followers were moved by seaplane to Eniwetok.

A storm of objections to the test arose from many

quarters. Many authorities thought the tests ill-timed. Rep. R. Thomason (Democrat, Tex.), senior member of the military affairs committee, said, "In less than 10 months after V-E day, with all the war talk that is going on, you are sending these ships out to the far Pacific for a vast display when the world is on fire and everybody thinks we are going to have another war with a great power."

Another objection was to the cost. Congressmen pointed out that they were being asked to permit the use of ships which originally cost \$400,000,000 as targets in the tests.

The Federation of Atomic Scientists apposed the tests. In a letter to the *Review of Scientific Instruments*, L. A. du Bridge declared, "It is safe to dismiss as negligible the scientific value of the tests."

There were rumours of friction over the tests between the navy and the army air forces, and on March 1, 1946, Blandy made a statement that there was "no desire to rig this test" either for or against the navy or the army air force.

Meanwhile, Sen. McMahon proposed to Pres. Truman that final control of the tests and their evaluation be placed in the hands of a board of civilians and not in the armed forces. Eventually two evaluation boards were created, one known as the Evaluation Board of the Chiefs of Staff, the other as the President's Evaluation board.

Finally, there was a flood of complaints and dire predictions from ill-informed persons who prophesied destruction of all the fish in the sea, tidal waves, earthquakes and the splitting open of the floor of the Pacific, with all the water disappearing into the earth's interior.

Adm. Blandy made it clear that there was no intention of any attempt to simulate battle conditions in the test. The chief purpose of the test was "to provide the data which are needed by the Army and Navy in planning for the future along sound and economical lines." A secondary purpose was "to provide the data which scientists desire" insofar as this did not conflict with the primary purpose.

On March 23, 1946, when preparations for the Bikini tests were well advanced with a large part of joint task force 1 at work at Bikini, Pres. Truman announced, without warning, that the first bomb explosion, then set for May 15, would be delayed about six weeks. The White House announced that this was done to enable congress to keep at work on the legislative program since a large number of senators and representatives wished to see the test. There was much speculation as to whether or not international considerations were behind the president's decision. Blandy stated that the delay would throw the bomb tests into a period when weather conditions might prove more difficult.

The magnitude of Operation Crossroads was exemplified by the fact that joint army-navy task force 1 included 150 ships and a personnel of 40,000 men. Seventy-six aeroplanes were included in the force. The U.S. invited each of the nations represented on the United Nations Atomic Energy commission to send official observers and press representatives to the test. The official observers travelled to Bikini on the U.S.S. "Panamint" and the press representatives, along with the U.S. news correspondents and radio commentators, on the U.S.S. "Appalachian."

The Target Ships.—Seventy-five ships were placed in the target area for the first test. The battleship "Nevada," at the centre of the target area, had been painted with bright orange and white stripes as an aid to the bombardier who was to drop the atomic bomb. The "Nevada" was approximately three miles from the white sands of the palm-fringed beach of Bikini Island.

Four other battleships and two aeroplane carriers were placed close to the "Nevada." These included the "Pennsylvania," which like the "Nevada" had survived the Japanese attack on Pearl Harbor, the "Arkansas," which first saw action at Vera Cruz in 1914, the "New York," likewise a veteran of World War I, the captured Japanese battleship "Nagato" and two aircraft carriers, the "Saratoga," veteran of World War II campaigns in the Pacific, and the smaller "Independence." These seven ships were tied up to mooring buoys close together. The usual method of anchoring ships so that they can swing at anchor without danger of collision was not followed.

The other ships were arranged around these seven in an area with a radius of approximately 1,000 yd. They included battleships, cruisers, destroyers, attack transports, submarines and various smaller craft. Among them were two of the oldest and heaviest U.S. cruisers, the "Pensacola" and the "Salt Lake City" and the German heavy cruiser, "Prinz Eugen," which did much damage in the early days of World War II. The arrangement bore no relation to the usual method of deploying a task force under battle conditions. For example, a line of destroyers extended outward from the inner portion of the target area. This was so that the effect of the bomb might be determined on comparable ships over increasing distances.

Devices ranging from complex scientific apparatus whose exact nature was a scientific secret to empty gasoline cans were included in the scientific instruments distributed on the 75 target ships and the shore of Bikini Island. An empty gasoline can makes a good pressure recorder because it is easy to determine in advance how much force is needed to cave in its sides.

The ships themselves constituted scientific instruments since a ship is a complex structure about which a great deal is known, and naval engineers and architects would be able to interpret what happened to the ships in the test.

The apparatus distributed throughout the target areas included pressure recorders, temperature recorders and apparatus to measure the radiations from the bomb. These were supplemented with live animals including goats, pigs and rats. All sorts of equipment ranging from aeroplanes to samples of paint were exposed on the decks of the target ships. Still and motion picture cameras, controlled by automatic devices, were installed on towers on Bikini Island.

A spectacular feature of the plans for Operation Crossroads was the use of drone planes and boats. It was planned to fly pilotless planes or "drones" closer to the atomic cloud than a pilot could safely fly. These planes would be headed into the danger area by control planes and "picked up" again on the other side of the danger area by other control planes. Plans were also made to use drone boats, controlled from aeroplanes, to take samples of the water in the lagoon immediately after the bomb explosion.

Test Able.—The first bomb test at Bikini, on July 1 (Bikini time) was usually spoken of as "Able"—code word for the letter "A." The ships of task force 1 stood off to sea, approximately 20 mi. north of Bikini for the test. At exactly 30 sec. after 9 A.M., the atomic bomb was dropped from the B-29, "Dave's Dream." Col. Woodrow P. Swancutt was the pilot and Maj. Harold H. Wood the bombardier.

Observers with the task force saw a bright lightning-like flash when the bomb exploded. A ball of fire appeared on the horizon in the direction of Bikini Island; it grew rapidly until it appeared three miles in diameter. Then it collapsed as quickly and in its place was seen the atomic bomb cloud climbing into the sky. It rose to a height of five miles in about two and a half minutes, luminous, creamy white in colour, marked with streaks of pink, old rose, apricot, salmon and other pastel colours. The top of the cloud quickly fanned out into the familiar "mushroom." Ten minutes after the bomb explosion, black smoke began to rise on the horizon, indicating that the bomb had set a number of ships on fire.

By noon of July 1 the radioactivity had subsided sufficiently to permit the ships of task force 1 to re-enter the lagoon. The press and radio representatives made a tour of the target area in an LCT on July 2 and boarded several of the damaged ships on July 3 and 4.

On July 11, reports of the two evaluation boards were made public. The members of the Evaluation Board of the Joint Chiefs of Staff were Karl T. Compton, chairman; Bardley Dewey, deputy chairman; Thomas F. Farrell; Gen. Joseph W. Stilwell; Lieut. Gen. Lewis H. Brereton; Rear Adm. W. R. Purnell; and Rear Adm. R. A. Ofstie. Their report can be summarized as follows:

When the bomb exploded, a destroyer and two transports sank promptly and another destroyer capsized and sank later; the Japanese cruiser "Sakawa" sank the following day. The superstructure of the submarine "Skate" was badly damaged. The light carrier "Independence" was badly wrecked by the explosion and gutted by fire. All of these vessels were within one-half mile of the explosion point. Numerous fires were started on other ships, including one two miles distant, which was apparently the result of some unusual circumstance since all the other fires were much closer. The only major combatant ships within a half mile of the explosion point were the battleships "Nevada" and "Arkansas" and the

Operation Crossroads, showing the cloud formation above a 1/2-mi. wide column of water following the first underwater detonation of an atomic bomb, near a fleet of target ships anchored off Bikini atoll in the Pacific on July 25, 1946. This photo was taken by an automatic camera from the atoll

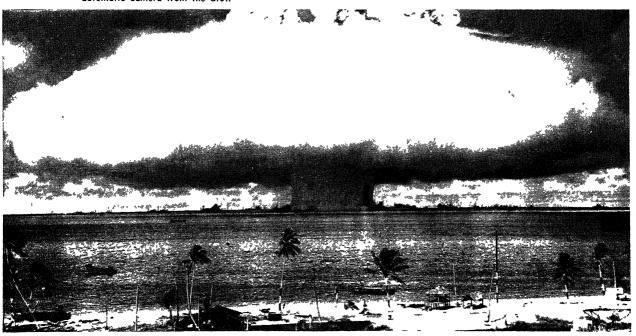
heavy cruiser "Pensacola." The superstructures of these were badly wrecked and they were unquestionably put out of action and would, along with many others within three-fourths of a mile, have required extensive repairs at a principal naval base. Other ships suffered varying degrees of damage, but there was relatively little damage at distances greater than three-fourths of a mile.

Examination of the flashburn effects produced by the initial radiation from the explosion indicated that casualties would have been high among exposed personnel, but persons sheltered within the hull of a ship or on deck in a shadow would not have been immediately incapacitated by burns alone. However, persons within the area of extensive blast damage to ship superstructures, even though within the ships, would have been exposed to a lethal dosage of radiological effects.

Essentially the same conclusions were given in the report of the President's Evaluation board. The members of this board were Sen. Carl A. Hatch (Democrat, N.M.); chairman, Sen. Leverett Saltonstall (Republican, Mass.); Rep. Walter G. Andrews (Democrat, N.Y.); Edward U. Condon; Karl T. Compton; Bradley Dewey; William S. Newell; and Fred Searls.

In a subsequent report made public on Aug. 2, the Evaluation Board of the Chiefs of Staff stated that the bomb had burst so that only one ship was within 1,000 ft. of the surface point directly underneath, that there were about 20 ships within half a mile, all badly damaged, many being put out of action, and five sunk. It added that measurement of radiation intensity and study of the exposed animals showed that the initial flash of principal lethal radiations would have killed almost all personnel normally stationed aboard the ships centred around the air burst and many others at greater distances.

Test Baker.—The second test at Bikini, frequently referred to as "Test Baker" (for "B"), took place at 8:35 A.M. on July 25 (Bikini time). The bomb was exploded "well below" the surface of the lagoon. It had been suspended from LSM-60 near the centre of the target array.



At the moment of explosion, a luminous dome rose on the surface of the lagoon, followed by an opaque cloud that enveloped about half of the target area. The cloud disappeared in two seconds, revealing a column of ascending water which lifted the 26,000-ton battleship "Arkansas" into the air for a brief moment. The column of water, about 2,200 ft. in diameter, rose to a height of 5,500 ft., sending spray still higher. It was estimated that the column contained 10,000,000 tons of water.

The column held its shape for several minutes while an expanding column of spray from it engulfed about half of the target ships. The base of the column was surrounded by a wall of water several hundred feet high, while waves going outward from the explosion were from 30 to 100 ft. high even at a distance of 1,000 ft. However, the waves diminished rapidly and were only seven feet high at Bikini Island, about three miles from the explosion point.

The Evaluation Board of the Joint Chiefs of Staff reported that two major ships sank, the battleship "Arkansas" immediately, and the heavy-hulled aircraft carrier, "Saratoga," seven and a half hours later. A landing ship, a landing craft and an oiler also sank immediately while the destroyer "Hughes," in sinking condition and the transport "Falcon," badly listing, were later beached. The submerged submarine "Apogon" went to the bottom, and one to three other submarines were believed to have sunk. The badly damaged Japanese battleship "Nagato" sank five days later.

The board reported that the explosion produced intense radioactivity in the waters of the lagoon. The radioactivity immediately after the burst was estimated to have been the equivalent of many hundreds of tons of radium; exposure to it would have incapacitated personnel and caused death within a few days or weeks. The target ships were showered with radioactive water so lethal that four days after the test it was still unsafe for inspection parties to spend "any useful length of time" in the centre of the target area or on the ships anchored there.

The President's Evaluation board devoted part of its second report to a comparison of the two tests. After calling attention to the fact that both bombs sank some ships, it concluded that the ships remaining afloat appeared to suffer more damage from the aerial explosion, but that the effects of persistent radioactivity on personnel would have been much greater in the second.

The report concluded: "As was demonstrated by the terrible havoc wrought at Hiroshima and Nagasaki, the Bikini tests strongly indicate that future wars employing atomic bombs may well destroy nations and change present standards of civilization. To us who have witnessed the devastating effects of these tests, it is evident that if there is to be any security or safety in the world, war must be eliminated as a means of settling differences among nations."

Future of Atomic Energy

Scientists agreed with Adm. Blandy that Operation Crossroads was well named. One of the roads led to an international atomic armament race certain to end in World War III and the destruction of civilization. The other road led to the peaceful development of atomic energy for the good of all humanity. They felt that the U.S. had started in the right direction by placing atomic energy under the control of a civilian Atomic Energy commission. But they realized that the fate of the world

hung upon the attainment of an agreement in the United Nations for an international Atomic Development authority such as had been suggested in the Acheson-Lilienthal report and in Baruch's proposal to the United Nations Atomic Energy commission.

Scientists were convinced that there were no defenses against the atomic bomb itself, only against possible carriers. In the event of an atomic bomb race, a nation would have to ring its borders with radar stations on the alert 24 hr. a day for an incoming rocket or aeroplane. Anti-aircraft guns would have to be constantly manned and pursuit planes ready to take to the air on a second's warning. But such a defense would have to be 100% effective to serve its purpose. If a city were attacked by 100 rockets carrying atomic bombs and the defenses stopped 99, the 100th would still be sufficient for the total destruction of the city. There would also exist the danger of bombs smuggled in by saboteurs. Scientists believed that in the event of an atomic bomb race it would be necessary to abandon all large cities and spread the population throughout the countryside so that a bomb might destroy a village but not a city. Factories would have to go underground in deep mines or in tunnels under

It was apparent to everyone that the future of navies must be studied in the light of the Bikini tests. Scientists pointed out that it was not enough to consider the problem of one atomic bomb against a fleet but the combination of several, some exploding in the air, some in the water. It seemed obvious that two atomic bombs, one exploding in the air and the other underwater, would completely wreck any attempt at an amphibious landing. One question that arose was whether a fleet would dare enter a harbour or even narrow waters in time of war.

The atomic bomb converted about one-tenth of 1% of the mass of U-235 or plutonium into energy. Scientists foresaw the possibility of the eventual production of far more powerful bombs, perhaps converting 2% or 3% of some process other than fission. Moreover, they visualized the combination of atomic bombs with many other types of offensive weapons, e.g., rockets travelling in the stratosphere with supersonic speeds. They were convinced that the first 24 hr. of World War III would see the complete destruction of the principal cities of the contending nations. They were certain that World War III would be fought with rockets bearing atomic bombs, with radioactive poison gases easily made as by-products in atomic bomb plants and with methods of biological warfare for the wholesale distribution of blights and rusts, capable of destroying crops and disease germs and viruses capable of starting terrible epidemics among farm animals and human beings.

Peacetime Possibilities.—Physicists believed in 1946 that the development of uranium piles for the generation of power was possible in the near future. The simplest method pictured was to use the energy to heat water to steam which would operate turbine-generators for the production of electricity. Such piles would need extremely careful shielding to prevent the escape of neutrons and harmful radiations into the surrounding neighbourhood. At first it was estimated that such plants could only compete with coal *at \$15 a ton, but it was later agreed that they might even operate at costs below the cost of coal.

Many physicists believed that such power plants might be made small enough to be installed in ocean liners but they did not see how they could be made small enough for use in automobiles or aeroplanes.

· Physicists did not regard uranium fission as the final

chapter in the story of atomic energy. On the contrary, it was only the first. It was entirely within the range of possibility that methods of releasing atomic energy other than fission to convert larger percentages of the mass involved into energy might be discovered.

The knowledge of atomic energy at the close of 1946 could be compared with the knowledge of electricity in the time of Benjamin Franklin. Franklin proved that the destructive lightning bolt was electricity, but man at that time had at his disposal only the feeble static electric machine. There seemed no reason to suppose that the conquest and utilization of atomic energy would not duplicate the history of electricity. It was possible, therefore, that in time atomic energy would cause as great changes in the life of the world as did the introduction of steam and the Industrial Revolution. (See also Chemistry; International Law; Metallurgy; Physics; Standards, National Bureau of; Uranium.)

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Attlee, Clement Richard

), British statesman, was born Jan. Attlee (1883– 3, 1883, in London of a middle-class family. He was educated at Haileybury college, Hertfordshire, and University college, Oxford, was admitted to the bar and practised law at Inner Temple (1905-10). He joined the Labour party in 1907 and became a lecturer at the London School of Economics in 1913. During World War I, Attlee joined the army, serving in the middle east and France and attained the rank of major. After the war, he actively engaged in politics and was elected member of parliament for Limehouse (1922). He held important positions in the first Labour government and was chancellor of the Duchy of Lancaster (1930-31) and postmaster general (1931) in the second Labour government. Elected party leader in 1935, Attlee denounced axis aggressions.

On May 10, 1940, Prime Minister Churchill named Attlee lord privy seal and deputy leader of the house of commons in the wartime coalition cabinet. Attlee also held the posts of deputy prime minister and lord president of the council in the Churchill government. He was a member of the British delegation to the United Nations conference in San Francisco (April-June 1945.)

After the Labour party victory in the general elections, Attlee became prime minister (July 26, 1945) and took Churchill's place at the Big Three conference in Potsdam. In Nov. 1945, Attlee, Pres. Truman and Prime Minister Mackenzie King of Canada met in Washington, where they issued a joint recommendation (Nov. 15) for international control of atomic energy. At the opening of the first U.N. general assembly session in London (Jan. 10, 1946), the British prime minister warned that failure to control atomic energy would result in "immense ruin" and virtual "annihilation" of the "most highly civilized portion of mankind." In 1946, Attlee obliquely opposed Pres. Truman's request that displaced Jewish refugees in Europe be permitted entry into Palestine. In the latter part of that year, Labourite "rebels" in commons denounced British foreign policy as having become "too Americanized." Attlee repudiated these charges and criticized, for the first time, Churchill's Fulton (Mo.) speech, declaring that if it was intended to establish an exclusive U.S.-British alliance, "then we do not agree with it."

Attu

See World War II.

Auchinleck, Sir Claude John Eyre

Sir Claude Auchinleck (1884-), British army officer, was born in England, the son of Col. John Claude Auchinleck, He served in India in 1902, and was stationed in Egypt and Mesopotamia during World War I. In 1933 and 1935, he fought with British forces quelling native uprisings on India's northwest frontier. Made commander of the Allied forces in northern Norway in the spring of 1940, Auchinleck took Narvik but had to evacuate the city when the Allies failed to make additional landings in the south. After the collapse of France in the summer of 1940, Auchinleck was appointed general officer commanding the English southern command; he organized England's first defenses against the threatened German invasion. In Dec. 1940, he returned to India as commander in chief, and in July of the next year was made commander in chief of British middle east armies, succeeding Marshal Wavell. Auchinleck's armies in Libya launched an offensive Nov. 18, 1941 and advanced far into Libya but were driven out in June 1942. On June 18, 1943, he was again made commander in chief in India and directed the strategy of Allied forces which repelled the Japanese attempt to invade India from Burmese bases in March 1944. He was promoted to the rank of a field marshal on May 31, 1946, and later was made a member of the executive council that was to serve as India's "caretaker government."

Auckland

The largest city of New Zealand and a thriving seaport, Auckland is situated on the east coast of North Island, capital of the province of its name. Pop. (1945) 300,067. As New Zealand's naval base and one of the cities around which both dominion and large numbers of U.S. soldiers and sailors were quartered or hospitalized during World-War II, Auckland for six years of the decade 1937-46 was strongly affected by war conditions. Those conditions slowed down or stopped all development works except those of a military character, but they also caused acceleration of population growth. The 1945 census figure of 300,067 people (one-sixth of the dominion's total) in the Auckland metropolitan area, compared with 212,159 in 1936. Hence housing needs presented the major immediate postwar problem; expenditure of £100,000 by the city council on temporary and transit accommodation provided but slight amelioration. A peculiarly difficult part of the problem was created by the increase of the Maori population to an estimated 8,000. There was no lack of developmental plans, but there was the familiar shortage of materials and skilled workers to carry them out. The largest work actually begun was the construction of a new waterworks dam at an estimated cost of £275,000, but high priority had been given to a new highway to Whenuapai aerodrome, the terminal of overseas and some internal air traffic. The general problem of transharbour transport with particular reference to the long-mooted harbour bridge was investigated by a royal commission. Additions to the city's facilities before the war included a municipal transport terminal for all buses running to the

suburbs, an Olympic-type swimming pool, the Chamberlain park municipal golf course, a waterfront road to the eastern suburbs and a flying boat base. A park on a headland overlooking the harbour was made in memory of M. J. Savage, the first Labour prime minister, and new botanical gardens were established. A free library system was introduced in Feb. 1946. The city's hospital accommodation was substantially increased by buildings constructed for military purposes. The population of Auckland city (as distinct from the metropolitan area) in 1946 exceeded 212,000 as compared with 102,295 in 1936, with a rateable valuation (annual rental system) of £3,493,000 for 1946–47. (E. V. D.)

Audiometer

See DEAFNESS.

Austin, Warren Robinson

Austin (1877—), U.S. statesman, was born Nov. 12, 1877 in Highgate, Vt. A graduate of the University of Vermont (1899) where he received his Ph.B. degree, he was admitted to the bar in 1902. He was chairman of the Republican State convention, 1908. Elected to the U.S. senate, Mar. 31, 1931, to fill out an unexpired term, he was re-elected Nov. 6, 1934 and Nov. 5, 1940.

His background in foreign affairs was broad and varied. He was the legal representative in China for U.S. interests engaged in building railroads there in 1917, studied conditions in Palestine under the British mandate in 1936 and made a study of the Puerto Rican legal system in 1937.

Austin campaigned against the League of Nations in the period after World War I, although he consistently supported U.S. participation in the World Court of International Justice. During his tenure as member of the senate foreign relations and military affairs committees, he changed his views on U.S. participation in a world peace organization in the 1930s and endorsed, in the main, the administration's foreign policy. He also took a leading role in the fight to amend the Lend-Lease act and was co-author of the first Selective Service act enacted in 1940. On June 5, 1946, President Truman named Austin U.S. representative on the United Nations Security council, and on July 18 he was named head of the U.S. delegation to the U.N. General assembly. The following month he resigned from the senate to devote all his energies to his new tasks.

Australia, Commonwealth of

A self-governing member of the British Commonwealth of Nations, Australia was formed by the federation of the six colonies (later states) of New South Wales, Victoria, Queensland, South Australia, Western Australia and the island state of Tasmania, and comprises also the Northern Territory and the Australian Capital Territory. Language, English; religion, Christian (census 1933: Anglicans, 2,565,118; Roman Catholics, 1,161,455; Presbyterians, 713,229; Methodists, 684,022; other Christians, 603,914; nil or not stated, 860,602). Australia lies in the southern hemisphere between longitudes 113° 9' E. and 153° 39' E. and latitudes 10° 41' S. and 43° 39' S. Total area: 2,974,581 sq.mi., nearly 40% lying within the tropics. Chief towns (pop. est.): Canberra, A.C.T. (capital) (12,200), Sydney (1,398,000); Melbourne (1,170,000); Brisbane (370,500); Adelaide (362,500); Perth (263,000); Hobart (70,800). Pop. (census 1933) 6,629,839; (est. June 30, 1946) 7,446,300.

There were, in addition, about 47,000 full-blood aboriginals (1944). About 98% of the population was of British stock

Prime ministers during the decade 1937–46: Joseph Aloysius Lyons (Jan. 6, 1932–April 7, 1939); Sir Earle Christmas Grafton Page (April 7, 1939–April 26, 1939); Robert Gordon Menzies (April 26, 1939–Aug. 29, 1941); Arthur William Fadden (Aug. 29, 1941–Oct. 7, 1941); John Curtin (Oct. 7, 1941–July 5, 1945); Joseph Benedict Chifley (after July 13, 1945).

Small State, Large Role.—The history of Australia in the decade 1937–46 was largely the record of a swift revolution in military and industrial development, and no less of a rapidly growing awareness of the large part which circumstances were constraining a small people to play in world affairs. Vast distances and geographical isolation became almost overnight a menace rather than a protection; and with the loss of natural security from foreign attack there vanished also the last traces of a mentality which had regarded local defense measures as an expensive insurance against contingencies remote to the point of impossibility.

In 1937 defense had to compete with the quest for material prosperity. The world depression of the early '30s had struck the vulnerable Australian economy with great severity, and it was not until 1937 that its effects had been finally left behind. In the middle of that year export prices, an infallible index to Australian prosperity, reached a high peak; unemployment fell to a tolerable level; real wage rates were increased; and the balance of trade became exceptionally favourable. Taxes were substantially reduced, and the last of the depression "cuts" in civil and war pensions and government salaries were restored. The dispute with Japan over the ill-starred "trade diversion policy" of 1936 had been settled, and Japan had resumed the purchase of Australian wool.

In the years before the outbreak of World War II only 1½% of the national income was provided for defense, and plans were made for a resumption of migration. A national insurance act in Jan. 1938 provided for general sickness and disablement benefits and a gradual transition to contributory old-age pensions, with unemployment insurance to follow. But the early promise was not fulfilled. A serious drought was experienced at the beginning of 1938, and export prices fell heavily. They remained unsatisfactory for the next two years, and the internal economy continued to give grounds for anxiety until the outbreak of war.

The Lyons coalition government (United Australia and Country parties) was returned to power in Oct. 1937, pledged to its national insurance proposals and a stronger defense policy which the Labour party had attacked as evidence of a suspected trend towards "foreign entanglements." In March 1939 R. G. Menzies resigned in protest against a decision to postpone the national insurance scheme, which was thought in some quarters to be incompatible with the pressing needs of defense. In the following month J. A. Lyons died, and the coalition collapsed with hard words after the election of Menzies as leader of the United Australia party. The new Menzies government met parliament only briefly before the outbreak of war put an end for the time being to the dissensions which had threatened its existence.

Preparation for war, though meagre in those three years, had not been entirely neglected. Lyons' proposals in May 1937 for a Pacific pact of nonaggression were followed within a few months by Japan's attack on China. Popular revulsion was immediate and widespread, but official policy, tied to that of Britain, stopped short at participation

in the mild protests of the League of Nations. A trade arrangement was negotiated in July 1938, but popular feeling was again revealed in Jan. 1939 when wharf labourers refused to load pig iron for Japan. News from the other side of the world was no better. In Sept. 1938 Lyons had declared that Australia stood with Britain on the Czechoslovak issue, but official leanings towards conciliation and caution were accompanied by a growing feeling that war could not be staved off much longer.

Defense preparations quickened appreciably during 1938. A three-year program for the expenditure of \$171,-000,000 was announced in March and in December was raised to \$234,000,000, largely in response to popular reaction to Munich. There was also considerable public support for the reintroduction of compulsory military training, suspended in 1929 by the Labour government of that day; but this was not done until after the outbreak of war, and then with a pledge that there would be no conscription for overseas service. Preparations on the industrial side were pushed ahead. The foundations of an aircraft industry were laid, and scientific and economic investigations into the availability of strategic materials set under way. In March 1939 it was decided to compile a national register of manpower, and the registration of wealth was added later in an endeavour to placate Labour hostility to anything savouring of industrial conscription. An industrial advisory panel was appointed, a register of productive capacity of defense significance compiled, and in June a new department was created to concentrate on problems of military supply and industrial development.

With events marching to their climax, Menzies in Aug. 1939 announced Australia's firm resolve to stand with Britain, whatever the consequences. On the evening of the day on which Great Britain declared war (Sept. 3), Australia was also at war with Germany. Within a few days a national security act gave the government almost unfettered power to make regulations in respect to matters affecting the prosecution of the war, but specifically excluded the power to impose military conscription for serv-



Within rifle shot of the fighting front Australian troops in New Guinea cast their votes in the federal elections of 1943

ice overseas or industrial conscription in any form.

First Two Years of War.—For two years Australia's territory remained uneasily free from foreign attack. But its resources were organized to build up its own defenses; to provide, equip and feed expeditionary forces and to assist in supplying the sinews of resistance to Britain and its dwindling band of allies. Immediately upon the declaration of war, action was taken to place the economy on a war footing. Overseas exchange transactions and coastal shipping were brought under control, price control was initiated and arrangements were made for the purchase by Britain of the wool clip and surplus food products. All exports were brought under licence, and overseas credit resources were mobilized for national use.

During the next two years these measures were refined and extended, and new controls were introduced. In order to conserve dollars for urgent war purchases, civil imports from "non-sterling" countries were progressively limited to the barest essentials. During 1940 restrictions were placed on the raising of new capital and the construction of buildings, and on the right of skilled metal tradesworkers to leave their jobs. In December a new department was established to organize and mobilize all labour and manpower resources. In early 1941 shipping and coal were brought under closer control, and a limited measure of rent control was introduced in March. With oversea shipping dwindling, the primary industries were reorganized, land sales were controlled, a merchant shipbuilding program was initiated and imports were further restricted.

At the outbreak of war the Australian army comprised a partly-trained militia force of 80,000 men. It was immediately decided to raise a special volunteer force of 20,000 men for service at home or abroad, and at the end of October to reintroduce compulsory military training for home defense as of Jan. 1940. The volunteer force (the second Australian imperial force) was progressively built up during 1940 to four divisions with corps troops. The training and equipment of the augmented militia forces was also vigorously pushed forward, under a plan intended to provide a home defense force of 250,000 men. During 1941 the strengthening of the second A.I.F. continued, and a division was sent to reinforce the Malayan defenses. As the Japanese threat became more menacing, the expansion and training of the home defense force was accelerated. By the end of 1941 the A.I.F. at home and abroad had a total strength of 200,000 and the total armed forces then in the commonwealth numbered more than 250,000.

Early decisions to send a small air expeditionary force to Britain were modified at the end of Oct. 1939 in favour of heavy participation in the new empire air training scheme. Australia's initial objective under this scheme was the training of 26,000 aircrew members by March 1943 and 10,000 aircrew members a year thereafter. Concurrently, Australia's own air force had to be built up. The immediate response was overwhelming, and the training scheme was constantly ahead of schedule. By the end of 1941 many more than 200,000 had volunteered for enlistment in the Royal Australian air force and more than 50,000 men had been selected for training under the empire scheme. When it ended in March 1945, Australia had supplied 37,057 aircrew members, three-quarters of whom had been fully trained in Australia, and large numbers of ground staff.

The exploits of the second A.I.F. and Australian naval and air forces in the middle east and north Africa were written into world history. They were in the forefront of

the Libyan campaign which carried Sir Archibald Wavell's army to Bengasi in Feb. 1941 but left one Australian division and a British armoured brigade in April to hold out for many long months in the historic siege of Tobruk. In the meantime, Australian forces played an important part in the campaigns in Greece, Crete and Syria between April and July 1941. The withdrawal to Australia of a large part of the seasoned veterans of the A.I.F., in the face of peril to the homeland, came towards the end of the drive which carried the British beyond Bengasi by the middle of Jan. 1942. Thirty thousand Australians, however, formed the spearhead of Gen. Bernard L. Montgomery's great offensive from El Alamein on Oct. 23, 1942, which marked the beginning of the end of German power in North Africa.

The activities of the fighting forces during the first two years of war were backed up by a growing industrial effort at home. Until the fall of France there was some failure by the people to appreciate the full scale of impending dangers, and the war effort was somewhat hampered by early administrative weaknesses and political differences. The difficulties were aggravated by a serious coal strike from March 11 to May 20, 1940. Thereafter war industry began to stride forward. A ministry of munitions was set up in May, and a vast production program was initiated which eventually turned Australia into the greatest Allied arsenal in the far east. During 1941 it was producing, in addition to many of its own machine tools and most of its heavy equipment, ammunition, small arms, grenades, bombs, mines, gun forgings, automatic weapons, anti-aircraft, naval and antitank guns, 25-lb. howitzers, and small naval craft. By the end of the year, more than 1,000 Australian-made aircraft were in service, and good progress had been made toward the manufacture of aircraft engines and heavy bombers and fighters.

It was remarkable that so much was achieved in the first two years of war with the political balance so precariously poised. In March 1940 the Country party rejoined the government, but repeated efforts to form a fully national government met with no success. In September the government's majority was reduced to one in the lower house and two in the senate, but further negotiations for a national government resulted only in the formation of an advisory war council without executive powers. Later rebuffs were accompanied by marked signs of discontent within the government's own ranks, which was diverted but not entirely allayed by the reorganization of the ministry accompanying the prime minister's "prospectus of an unlimited war effort" at the end of June 1941. A final offer by Menzies to give Labour half the representation in a national government and even to serve under John Curtin was rejected, and Menzies' resignation was announced on Aug. 28. The government formed by A. W. Fadden, leader of the Country party, was defeated on Oct. 3 on its budget proposals by the votes of two non-Labour independents. Curtin then set about forming the Labour cabinet which survived almost unchanged until his death on July 5, 1945.

One of the first acts of the new government was to bring the policy of the private banks effectively under the control of the Commonwealth bank and to limit their ability to make inflationary loans and excessive profits. A month later, rent control was widely extended, and rentals were pegged at approximately prewar levels. The new government achieved a place in history founded largely on the vigour and courage with which it carried out war policies which, for the most part, were basically repugnant to prewar Labour ideals.

War in the Pacific.—For Australia, the attack on Pearl Harbor and the fall of Singapore ushered in a new phase of the war, with invasion an imminent possibility and most of the trained fighting men, naval forces and operational air squadrons heavily committed thousands of miles from its own shores.

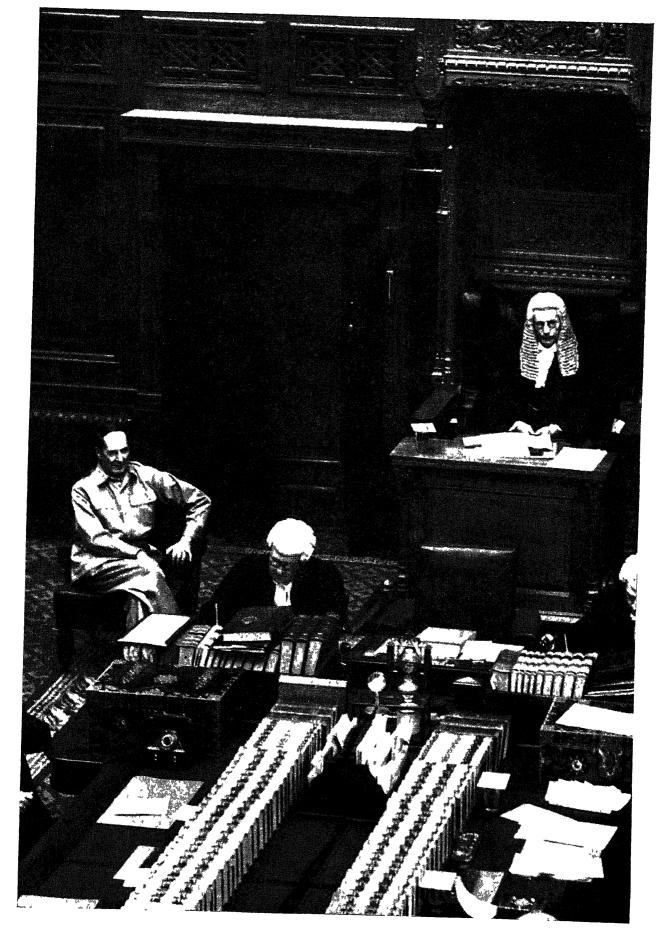
The home defense forces and those members of the A.I.F. still in Australia were immediately swung into defensive disposition, and naval and air forces were alerted for possible enemy raids. Transport services were placed under emergency control. Darwin's defenses were strengthened, blackouts were imposed in coastal areas and civilian defense arrangements were hurriedly completed. Holidays and leave for industrial and commercial workers were summarily suspended, and extensive overtime was ordered in war establishments.

Disaster came early. Within a few weeks Malaya had fallen, and most of an Australian division was in Japanese hands. Burma and the Netherlands Indies followed within a few months. In the meantime, the Japanese occupation of Rabaul and Kavieng at the end of Jan. 1942 threatened allied supply routes to Java and Australia. Port Moresby was bombed on Feb. 3 and regular air raids on Darwin began on Feb. 19.

It was in these circumstances that Australia turned to her friends for assistance. Under great difficulty, Britain agreed to find shipping to return a substantial proportion of Australian forces from the middle east, and expedited the supply of war equipment which was sorely lacking. Curtin had already made it clear, in a New Year message which aroused some passing controversy, that Australia "looks to America free of any pangs as to our traditional links of kinship with the United Kingdom." Australia did not look in vain, for it was chosen as the main base in the Southwest Pacific. Within a few months U.S. forces and equipment were arriving in ever-growing volume. And from the Philippines came Gen. Douglas MacArthur, under whose operational control Australia placed the army, units of the navy and 49 air force squadrons.

Meanwhile, Australia looked also to itself. Volunteers poured into the A.I.F., and large numbers of men were called into the militia. But the great need was for war material, and the government and the people set out to produce it at any cost. The cost included a complete revolution in the industrial economy, and the imposition of economic and social controls so fundamentally opposed to traditional Labour policy that possibly only a Labour government could have enforced them. Civilian industry was rapidly curtailed to free labour for national service. In Feb. 1942 severe restraints were placed on the freedom of workers to leave their jobs and of employers to hire and fire, and the allocation of manpower to industries and the services was brought under central direction on the principle of "work or fight."

At the same time, an executive body with full powers of conscription—the Allied Works council—was established to carry out the huge program of construction required for home defense and the offensive needs of the rapidly-growing Allied forces. To prevent the new pressures from leading to financial disorganization, sweeping measures were introduced to freeze wages, profits, land values and share prices at their then current values. In the following



years these measures were extended, adapted and supplemented as the industrial economy reacted to the successive pressures to which it was subjected. Rationing of consumer goods was introduced during 1942 and was reinforced by an "austerity campaign." Uniform income taxation by the commonwealth was forced on the states in the middle of that year, and upheld by the high court as a valid exercise of powers available even in time of peace. In April 1943 a rigid price ceiling was imposed, supported by subsidies. In the same year income-tax rates were raised to unprecedented levels, and in the last year of the war more than 40% of war expenditure was being met from current revenue.

Regimentation and austerity were accepted as the price of immediate salvation and ultimate victory. After the fall of Java further Japanese landings were made on the northeast coast of New Guinea, and the elimination of Port Moresby, the key to the defense of the Australian mainland, became the first Japanese objective. A largescale attempt by sea in the first week of May 1942 was smashed by Allied sea and air forces in the battle of the Coral sea. It was followed by a frontal assault across the towering Owen Stanleys, combined with a sea-borne attack on Milne bay to provide a base for air support from the eastern flank. The Japanese force which landed at Milne bay on Aug. 26 was flung back into the sea by Sept. 5. The attack from Buna met with more initial success, and the Japanese were within 35 air miles of Port Moresby by the end of September. Then began the long fight back over the historic Kokoda trail, to end, after desperate fighting, with the Australian capture of Gona on Dec. 9 and the capture of Buna and Sanananda by Australian and U.S. forces in Jan. 1943.

The Papuan campaign was followed immediately by the repulse of a Japanese attack on Wau, and a months'long pursuit of the Japanese forces. But Japanese strength was still being built up steadily throughout the northern islands, with nearly 250,000 troops disposed in an arc reaching from Bougainville to Timor. Fears of an attack on the mainland from the northwest were reduced by the great battle of the Bismarck sea in the first four days of March, when a large and heavily-protected Japanese convoy was completely wiped out. By June the Allied forces were on the offensive. While U.S. troops were driving through the central Solomons the Australians, with U.S. support were clearing the Japanese from the Huon peninsula. This campaign, which ended with the link-up of the Australian and U.S. forces near Saidor in Feb. 1944, opened the way for MacArthur's leap-frog advances along the northern New Guinea coast and into the neighbouring islands.

As MacArthur went west and north through Morotai to the Philippines with United States forces and some Australian naval and air support, it became the Australian task to attack and to contain nearly 150,000 Japanese bypassed in his spectacular moves. The Wewak-Aitape area was taken over in November, and more than 90,000 Japanese were gradually pushed back in the Gazelle peninsula after landings in New Britain in the same month. In Dec. 1944 two Australian divisions took over from U.S. troops at Torokina. In an 11-weeks' campaign beginning in May 1945, two veteran Australian divisions substantially completed the reconquest of Borneo. The success of the Australian operations was facilitated by the superiority achieved and maintained by the U.S. air forces.

It was only the unparalleled success of the initial opera-

tions which prevented Australian divisions from fighting with U.S. in the Philippines. Six divisions were in action when the war ended, and the equivalent of ten had been committed during the long campaign in New Guinea. At their maximum war strengths the Australian navy was 8 times, and the air force 60 times, their respective prewar strengths. Danger of embarrassment from the limitation on the use of the militia to Australia and its territories was reduced at the close of 1942 by Curtin's largely personal success in inducing his party to approve its use south of the equator in the Southwest Pacific area, and ended by the great increase in the strength of the volunteer A.I.F. by new recruitment and transfers from the militia. While there was some criticism of Labour policy in early 1943, the bitter conscription controversies of World War I were largely avoided. By the end of 1944, about 95% of the army combat forces, as well as the whole of the naval and air forces, had volunteered for service in any theatre of war. After 1943, embarrassment of the war effort seemed more likely to arise from industrial manpower shortages than from any lack of front-line fighters. These became acute as growing U.S. forces in the Pacific looked to Australia for much of their food, clothing and other war supplies; and when the pressure from that quarter relaxed its place was taken by new demands arising from the basing of the British Pacific fleet on Australia from the end of 1944. (See also World War II.)

Reconstruction.-When hostilities ceased, the Australian economy was extended almost to breaking point. Inflation had been kept at bay by a strong financial policy and rigorous economic controls. But total war left in its train acute shortages of civilian goods, a desperate housing situation and a labour force that was clearly showing the strain of six years of war. The new needs of demobilization and reconstruction offered little immediate relief. Early thought had been given to the problems that would follow the postwar contraction of the commonwealth's wartime powers, and in Sept. 1942 constitutional amendments were proposed to give the commonwealth sweeping economic and social powers. Intense hostility to the commonwealth's proposals was manifested in November at an all-party convention of commonwealth and state representatives, but a unanimous compromise eventually emerged from the welter of conflicting social philosophies, party loyalties and local prides. The state premiers and opposition leaders agreed that the state parliaments should be asked to "refer" to the commonwealth until five years after the cessation of hostilities a fairly wide but specific list of powers. Notwithstanding their unanimity, the agreed bill came in for so much opposition in the states that it was passed in a workable form only in New South Wales and Queensland. The commonwealth therefore decided in March 1944 to submit to the people proposals to amend the constitution to much the same effect. At the referendum in August of the same year they were rejected by a substantial majority. Thereafter there was little prospect of the full powers being "referred" by all the state parliaments, though their governments were willing in 1946 to delegate to the commonwealth temporary control over prices, rents, capital issues and land values. In the meantime, following doubts cast by a high court decision on the legality even of existing social services, it was decided to seek power to make laws in relation to marketing, social services and employment at a referendum held concurrently with the 1946 elections. The social services power was granted, but the marketing and employment proposals were narrowly rejected.

Curtin had given a pledge of "no socialization during

Austealia	Statistical Data	

		Au	istralia: Statistical Data			_
	1938		194 V=h		194. Value	
ltem	Value (000's omitted)	Amount or Number	Value (000's omitted)	Amount or Number	Value (000's omitted)	Amount or Number
Exchange rate Great Britain United States		£A1.25 =£1 £A1 =\$3.895		£A1.27 =£1 £A1 =\$3.198		£A1.25 =£1 £A1 =\$3.198
Finance Government revenues Government expenditures Gold reserve National debt	£160,425 (\$784,320)		£119,559* (\$482,061 £119,559* (\$482,061 £13,547* (\$54,622)	}	£299,126* (\$1,205,479) £299,126* (\$1,205,479) £40,274* (\$162,305) £1,193,687* (\$4,810,55	8)
Transportation Railroads		27,973 mi. 128,475 mi		27,943		27,213 mi.† 126,325 mi.‡
Communication Telephones		630,175 1,056,004		720,321 1,293,266		827,862 1,479,802
Minerals Gold		1,592,034 oz. 13,081,778 tons 268,341 tons 13,895,541 oz.		1,496,698 oz 15,917,945 tons 349,906 "§ 2,572,957 oz		
Crops Wheat		5,617,680 tons 3,834,880 " 907,200 " 565,600 " 386,400 "		4,671,840 tons 3,489,920 " 5,203,520 " 532,000 tons		3,291,587 tons¶ 3,042,897 ,, ¶ 4,130,539 ,, ¶ 590,300 ,, ¶ 670,942 ,, ¶
Livestock Sheep Cattle Horses Swine		111,057,832 12,861,781 1,724,056 1,155,591		125,776,000 13,687,000 1,645,000 1,445,000		105,415,235 14,133,154 1,359,130 1,630,466
Forest products Total	£759 (\$368) £289 (\$137)	3,011 tons				
Sea products Fish Pearl shell Crayfish, crabs and prawn Oysters :		32,150 tons 3,196 ,, 2,069,244 ,, 4,685 ,,				
Manufactures Total	£47,922 (\$234,290) £24,608 (\$120,308) £22,128 (\$108,184)					
Exports Total • • • • • • • • • • • • • • • • • • •	£37,435 (\$183,021)	392,000 tons 2,835,000 ,,	£125,825 (\$507,325) £26,331 (\$106,166) £7,404 (\$29,852)	245,000 tons 1,409,000 ,,	£124,371 (\$501,216) £39,558 (\$159,420) £21,150 (\$85,234)	289,000 tens 149,000 ,,
Gold bar, dust, ingot, sheet	£11,014 (\$53,848)	1,599,000 oz.	£17,227 (\$69,461)	2,016,000 oz.		
Meats preserved by cold process	£8,800 (\$43,024) £113,984 (\$557,270)	275,000 tons	£3,169 (\$12,779) £112,001 (\$451,587)	107,000 tons	£6,154 (\$24,800) £188,717 (\$760,529)	
Motor cars, chassis and parts	£8,420 (\$41,163) £6,107 (\$29,856)	483,958,000 gals.	£3,150 (\$12,702) £4,882 (\$19,683)	329,719,000 gals.	£2,836 (\$11,430) £17,280 (\$69,637)	978,355,000 gals.
goods	£5,618 (\$27,465)	•••	£7,686 (\$30,989)	•••	£18,265 (\$73,609)	250,134,000 sq.yd.
Iron and steel sheet and plate	£4,415 (\$21,584)	1 ¹ 93,000 tons	£3,914 (\$15,781)	127,000 tons	£4,479 (\$18,052)	164,000 tons
Defense Standing army personnel		35,157 (militia only)	130,000		
Standing air force personnel Military expenditures .	£7,453 (\$36,439)	2,472	£25,100 (\$96,132)	34,000		
Education State schools Average attendance Teachers employed Private schools Average attendance Teachers employed Technical and business schools Enrolment Teachers employed Universities Enrolment		9,9405 744,0955 31,1995 1,8635 219,1715 11,4965 2165 125,4925 4,003 85 14,2365			·	
*Financial year. †Gov	ernment only. \$1943.	§Silver, lead ores	and concentrates.	1940. ¶1944.	SExports only. 61939.	

the war" in his overwhelmingly successful 1943 election campaign, but his government did not entirely lose sight of its own social policies even during the darkest days of the war. Pensions were granted to widows in June 1942. In March 1943 a substantial national welfare fund was created to finance proposed new social services, and in April war pensions, repatriation benefits and maternity allowances were increased. In April 1944 a non-contributory sickness and unemployment benefit scheme was approved, but a "free medicine" scheme was later held to be ultra vires. In June 1945 civil pensions, after increases in 1942 and 1944, were raised by 20%; and child endow-

ment, first introduced by the Menzies government in 1941, was increased by 50%. A hospital benefits act came into operation in the first half of 1946, and in August the means test for civil pensions was liberalized. Little other legislation of a distinctively party flavour was attempted during the war. In March 1943 a mortgage department of the Commonwealth bank was approved to make long-term loans to primary producers. During Curtin's temporary absence the government announced in Nov. 1944 a plan to nationalize the interstate airways, but after some delay the high court refused to recognize the monopoly.

In the month in which hostilities ceased, however, ap-

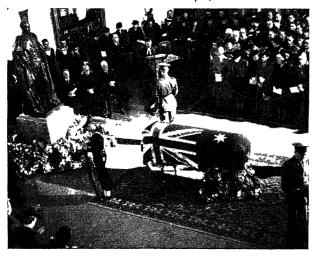
proval was given to comprehensive legislation introduced five months earlier to make permanent the main features of the wartime banking regulations, and to make the management of the Commonwealth bank responsible to the government in matters of broad policy. In Oct. 1945 parliament ratified agreements with the state governments providing for rental rebates to low-income tenants under government housing schemes, and in Aug. 1946 an act was passed to authorize a far-reaching scheme of reorganization of the coal industry.

Planning for reconstruction had begun in 1941 but was interrupted by Japan's entry into the war. A separate ministry for reconstruction planning was established at the end of 1942. In the following year, commissions were appointed to report on housing, rural reconstruction and the development of secondary industries, and the states were brought into a national works council to plan postwar public works. In May 1945 the government announced as the guiding principle of its postwar economic policy the pursuit of "full employment." About the same time a comprehensive act was passed governing the rights of ex-servicemen to rehabilitation benefits and reinstatement in old or preference in new employment. Its most controversial feature was the limitation of preference to a period of seven years, which represented a compromise between the wider demands of ex-servicemen and the reluctance of the labour movement. Demobilization was accomplished quickly, notwithstanding the need to disarm and guard large Japanese forces in the islands and to provide troops for the occupation of Japan. Re-employment presented fewer difficulties than might have been expected from Japan's unexpectedly sudden collapse.

The achievements of the Curtin governments during the war and of the Chifley government after Curtin's death formed the main theme of Labour campaigning in the elections of Sept. 1946. The Liberal (formerly United Australia) and Country parties stressed the need to look to the future. In the result, the Labour party was returned to power, though with some reduction in the large majority it had enjoyed from 1943. (See also New Guinea.)

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Funeral rites for Prime Minister John Curtin of Australia, who died at Canberra on July 5, 1945



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Australia, South

See South Australia.

Australian Literature

In the Australian novel and the short story, a greater variety of theme was employed during the decade 1937-46; writers showed a more complete assimilation of native environment. Xavier Herbert's Capricornia (1938) took a sociological attitude to the aborigines of the northeast, treating them as human beings caught in the struggle for adjustment with white civilization. Kylie Tennant wrote of working-class surroundings in The Battlers and Foveaux (both 1938); and later published Ride On, Stranger (1943). Leonard Mann in The Go-getter (1942) also wrote a grim economic depression tale and in Mountain Flat (1939) had dealt with the passions and greed for the land of settlers in a Victorian country district. A writer whose reputation was established during the period was Eleanor Dark, with Sun Across the Sky (1937) and Waterway (1938), both analytical novels; in The Timeless Land (1941) she presented a brilliant historical novel of the period of the first settlement of the continent. Miss M. Barnard and Flora Eldershaw continued their collaboration under the pseudonym of M. Barnard Eldershaw, with Plaque with Laurel (1937) about Australian literary people. A further novel by Henry Handel Richardson (Mrs. J. G. Robertson) was The Young Cosima (1938), a study of the Wagnerian circle. Katherine Susannah Prichard continued her realistic novels of western Australian country life with Intimate Strangers (1937); her Moon of Desire was more romantic. William Hay, in the Mystery of Alfred Dowbt (1937), returned as an important contributor to the Australian novel. In 1939, Miles Franklin collaborated with Dymphna Cusack in a satire Pioneers on Parade and in 1946 published My Career Goes Bung. In Legend for Sanderstead, Vance Palmer faithfully portrayed a north Queensland setting. Pastoral Symphony (1939) by J. J. Hardie, and The Pea Pickers (1940) by Eve Langley, were also

The short story had many able exponents, among them Myra Morris, James Hackston, Henrietta Drake-Brockman, Don Edwards, George Farwell and d'Arcy Niland, whose work appeared in various journals. F. Dalby Davison published The Woman at the Mill in 1940. Gavin Casey, a writer of quality whose dramatic stories had humour and optimism, published first It's Harder for Girls (1942) and later Birds of a Feather (1945). In The Persimmon Tree (1944) Marjorie Barnard drew women characters with psychological insight, and Margaret Trist dealt with homely situations and family relationships in The Sun (1943). James Brian showed quiet humour in First Furrow (1944) and Alan Marshall's These Are My People (1945) was rich in atmosphere and characterization. Katherine Susannah Prichard published Potch and Colour in 1945, and in the same year appeared A Girl with Red Hair by Douglas Stewart, a New Zealander, resident for some years in Australia, whose stories were

remarkable for polished diction, imagery and intensity.

The period was rich in poetry. Two schools were represented by *The Jindyworobak Anthology* and *Meanjin Papers*. The Jindyworobaks drew their inspiration from the Australian environment and rejected verbiage suggestive of European surroundings. The Meanjin school was more universal in approach and outlook. The schools were not exclusive and stimulated contemporary verse. Rex Ingamells, editor of *The Jindyworobak Anthology*, published several volumes, including *Content Are the Quiet Ranges* (1943).

Gina Ballantyne published delicate verse in *Phantom* (1942) and *Vagrant* (1943). William Hart-Smith, in *Columbus Goes West*, used economy of words and showed breadth of sympathy. Flexmore Hudson published *In the Wind's Teeth* (1940), *Indelible Voices* (1942) and *With the First Soft Rain*. Brian Vrepont used experimental forms in *Beyond the Claw* (1943). In 1940, Paul Grano published some outstanding lyrics. Perhaps the most intellectual poet in Australia, R. D. Fitzgerald published *Moonlight Acre* in 1938. In 1944, Kenneth Slessor published *roo Poems*. In *Adagio in Blue* (1938), T. Inglis Moore wrote in lyrical mood; but in *Emu Parade* (1941) was disillusioned. *Poets at War* (1944), compiled by Ian Mudie, contained the work of nearly 80 servicemen.

Australian drama showed development and the work of Dymphna Cusack in *Red Sky at Morning* (1942), Douglas Stewart's *Ned Kelly* (1943) and Helen Drake-Brockman's *Men without Wives* was notable.

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Austria

Austria is a nation in central Europe; area 32,360 sq.mi.; pop. (est. 1939) 6,694,782, more than 90% Roman Catholics. Almost the whole population is German-speaking. Capital: Vienna, with a pop. (1939) of 1,918,462; other leading cities are: (1939) Graz (210,175); Linz (131,423); Innsbruck (80,084); and Salzburg (79,264). Austria is a federal state consisting of eight provinces (Lower Austria, Upper Austria, Salzburg, Styria, Carinthia, Tirol, Vorarlberg, Burgenland), and a mediatized city, Vienna. Austria was an independent republic from 1918 until March 13, 1938. Its last president prior to World War II was Wilhelm Miklas (re-elected Oct. 9, 1931), its last federal chancellor Dr. Kurt von Schuschnigg. After the restoration of Austria in 1945, Dr. Karl Renner became chancellor. At the end of Dec. 1945 he was elected president, and Leopold Figl became chancellor.

Losing Struggle.—Around the middle of 1937, the fate of Europe for the succeeding ten years had been decided. The united front of the big European powers for the maintenance of the status quo, and for the frustration of Hitler's aggressive tendencies, had finally collapsed.

Around the Spanish Civil War, two groups of countries had crystallized, opposed to each other for political, economic and ideological reasons. On the one side were the western democracies and the soviet union; on the other Germany and Italy with their growing sphere of European influence, to which Poland and Yugoslavia belonged at that time no less than Hungary.

At the focal point—the middle Danube—the independent and free state of Austria was situated. After Jan. 1933, this country had fought a desperate battle for existence with Hitler. The annexation of Austria had been Hitler's first acknowledged aim. National socialist Ger-

many at first tried to achieve this objective through economic strangulation by means of an all-embracing boycott, which was to prevent all commercial and tourist traffic. When this did not have the desired results, Hitler began to expend large sums of money to corrupt the inner administration of Austria and to create a revolution in the country. A bloody civil war in July 1934 resulted, in which the Austrian chancellor, Dr. Engelbert Dollfuss, was murdered. A deputy of the German reichstag, Theo Habicht, had until that time been in charge of the conquest of Austria from within; he was recalled when Dollfuss was murdered, but the revolution had failed through the resistance of the Austrian people. Significantly, however, Habicht was at once made mayor of a large city in the Rhineland and later undersecretary of state in the German foreign office.

The Austro-German frontier was the country's longest, stretching for hundreds of miles; in the east Austria bordered on Hungary, a friendly country, but with very close economic ties to Germany, in the southeast on the outspokenly hostile and Germanophile Yugoslavia of Premier Stoyadinovich, in the north on Czechoslovakia, a good neighbour who, however, was threatened by Germany just as much, and in the south on Italy.

To meet the German threat—for there was no other threat to the independence of the Austrian state—Austrian policy tried to use various means.

In foreign policy, the government tried to obtain an international guarantee for Austria; the idea of such a guarantee was an obvious one, as Austria had been ordered by the Covenant of the League of Nations and by subsequent treaties to maintain its independence under all circumstances. This duty had remained in force, and the large powers had confirmed repeatedly that they wished to see the national independence of Austria maintained, but beyond that no formal guarantee had been given.

In economic policy, Austria had made far-reaching agreements with its neighbours Italy and Hungary (Roman Protocols, 1934), including a political alliance to maintain the independence of Austria.

In interior policy, there was a strong concentration of the whole political leadership in the hands of a government nominated by the elected head of the state. Parliament was dissolved in 1934 after it had agreed on a new constitution, which replaced political parties by a system of corporations. The political parties were dissolved and their further existence forbidden, as this was the only way in the view of the government to prevent Austria from being overrun by a nazi party led and financed by the German reich.

The farther Italy moved away from the policy of the great powers and thereby associated itself with Germany, the more doubtful became its support for Austria. Because of the general state of tension in Europe, caused at first by the Ethiopian conquest and later by the Spanish Civil War, Hitler was increasingly successful in obtaining a free hand. The position of the unprotected Austrian state was therefore becoming increasingly precarious. For that reason Austria began to negotiate directly with Berlin, trying to persuade Hitler to give formal and legal recognition to the national independence of Austria, to put an end to the economic war, and to undertake not to interfere in the internal affairs of the country.

A treaty along these lines was actually obtained. In the agreement of July 11, 1936, Hitler for the first time recognized the independence of Austria.

It was obvious from the first that Hitler did not mean to keep this agreement; he left no doubt as to that in private conversations which were reported from time to time. But it was just as obvious that Hitler, for reasons of foreign policy, had decided to create the impression for the time being that he had given up his aggressive designs in central Europe. He expected that such an action would help to ease the alarm which the remilitarization of the Rhineland (1936) and the increasing re-armament (1935–37) had provoked in Great Britain and France. Hitler's desire for a temporary state of tranquillity in Europe gave rise to justified Austrian hopes for gaining time. But in 1937 it became increasingly obvious that Hitler wanted to regain a free hand. The old policy of political provocations was started again.

The friendship between Berlin and Rome was getting closer in all respects. Italy informed the Vienna foreign office after Mussolini's famous visit to Berlin in Sept. 1937, that the Italian position with respect to Austria had not changed, and that the Austrian question had not been discussed in Berlin and Rome, but there were many signs which disproved this diplomatic talk.

In the fall of 1937, the Vienna police finally discovered a secret plan for a National Socialist revolution in Austria which was to be supported by an invasion by the German army. Incidents were to be provoked artificially to cause the uprising and to present Germany with a formal reason to intervene, The material found showed clearly that the plan had been made in agreement with nazi party offices as well as with official German support.

Austria answered with a diplomatic protest and attempted to obtain from Hitler a confirmation of the treaty of July 11, 1936.

Austria considered it important to gain still more time, as reliable information indicated the possibility of a rapprochement between London and Rome. Austria felt sure that Hitler would not attack as long as he was not certain of close ties with Italy to guard his southern frontier. On the other hand, Austria had to consider that the German general staff would want to occupy the Inn valley (north Tirol), because it considered an effective defense of southern Germany impossible without it.

In Jan. 1938, Hitler, through Franz von Papen, the German ambassador to Austria, invited the Austrian chancellor Kurt von Schuschnigg, to visit him in Berchtesgaden. To obtain an acceptance of this invitation Hitler expressly agreed that he was prepared to reaffirm the independence of Austria, and to forego all interference in its internal affairs. There were not to be any new demands. The visit came about on Feb. 12, 1938.

Hitler-Schuschnigg Meeting.—Many descriptions of the meeting at Berchtesgaden, published subsequently by presumably informed sources, were pure invention. Some were disseminated by the nazis themselves for propagandistic purposes. In reality, only a bare minimum of etiquette customary to international relations was observed at the meeting. Even Hitler's personal behaviour was not surprising, despite the fact that the meeting was unique and without precedent. The Austrian negotiator was prepared for anything, even for one of the motorcar accidents which had marked diplomacy in the third reich. He placed no great faith in Hitler's advance assurances of Germany's will for Austrian independence.

The visit at the Berghof lasted for almost 12 hours without interruption. It was so staged that most of the conversations were face to face—again not in conformity

with the usual international protocol. Hitler's gestures and his voice were quite in keeping with the attitudes made famous through news photographs, motion pictures, the radio and even the pages of *Mein Kampf*. The only difference for Schuschnigg was that he was now face to face with the fuehrer.

The development of Hitler's ideas was absolutely in conformity with mass-meeting standards, essentially thus:

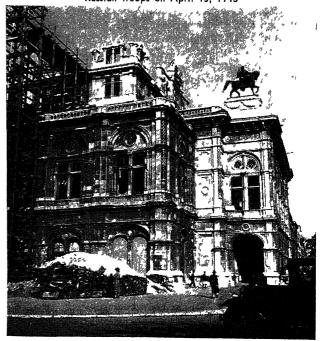
"The rise of an obscure soldier to leadership of the Germans has brought the creation of a class-less, party-less, socially unprejudiced, unified people, not split by denominational conflict. All of Germany's neighbours belong to this nation, insofar as they are German-speaking. I am about to fulfil a historic mission, guided by providence, from which no one will deter me. Thus far I have achieved everything I have set out to do, and so have become the greatest German of history. Austrian history, including that of the Habsburgs and the Catholic church, has been one great series of treason against the people. This nonsense must be put to an end. Therefore, I have decided to solve the Austrian problem once and for all. One week from now, I will step before the German reichstag to report on the course of events. Therefore, I have no time to lose. If we arrive at no conclusions, I will have to make my own decisions tomorrow night."

(The character of these decisions was adequately conveyed by the simultaneous, provocative presence of the staff generals of the Wehrmacht at the Berghof!)

"Austria should by no means believe that I am bluffing, nor should it expect help from any source. I am in agreement with Mussolini. France is in no position, and England is not willing, to help Austria. If you are reasonable, you will be able to enter your name in history alongside those of other great Germans like Goering, etc. If not, everything else will take its course of its own accord."

Thus the state of affairs was clear; Hitler's decision left no room for doubt. The British diplomat with whom Hitler claimed to have discussed the German claim to

Vienna's state opera house, showing the damages resulting from the bombing and fighting prior to the capture of Austria's capital by Russian troops on April 13, 1945



"Austrian liberation" only a short time before in that very same room, had voiced no objections, according to the fuehrer. Assuming the story was true, that diplomat could have been only Lord Halifax or Ambassador Nevile Henderson.

Finally, Hitler presented Schuschnigg with a list of demands which bore the character of ultimatums and specified deadlines. Evidently he had only the vaguest and most superficial conception of the list's contents, and did not permit any discussion thereof. The responsible authors were probably in Austria.

According to these demands, the Austrian government was to appoint a National Socialist (Arthur Seyss-Inquart) as minister of police, decree general amnesty for all nazis and grant full political equality to all National Socialists.

Hitler, however, declared his definitive recognition of Austrian sovereignty and its constitution, as well as his willingness not to interfere in internal Austrian affairs. This "guarantee" was the condition under which Schuschnigg had agreed in the first place to go to Berchtesgaden.

Hitler's "treaty" was signed as the optimum achievable at the moment. Otherwise a march on Austria by German troops that very night would have been the strongest probability. After signing the document, Hitler declared his belief "that there would be peace for five years now"; that he "would like to spare the world another war, but, unfortunately, wasn't being heeded"; and that, after all, he was "about to arm the best Wehrmacht in German history, and it would be foolish not to use such a splendid instrument."

For all intents and purposes the independence of Austria had been lost. Hitler nominated a new gauleiter for Austria as early as Feb. 13, 1938. Hitler thus violated his promise of non-interference in internal Austrian politics the very day after he signed the agreement.

In the succeeding weeks, Germany, in spite of all promises, tried to force Austria to make new concessions to give up its independence, and tried to achieve this aim openly by creating disturbances in the country.

Schuschnigg therefore ordered a universal and free plebiscite to be held, which was to prove that the majority of the Austrian people wished their country to remain free and independent. The proposal to be voted upon merely contained the declaration which Hitler himself had confirmed in writing on Feb. 12, 1938. The plebiscite was to be held on March 13, 1938. On March 11 Hitler at first demanded a postponement, threatening military occupation otherwise. The plebiscite was therefore postponed.

Anschluss.—Thereupon Hitler demanded the immediate resignation of the Austrian government, which was to be replaced by National Socialists named by him; only in this case would he be prepared to abstain from invading the country. When Austria had been forced to accept this ultimatum as well, to save its freedom, Hitler gave orders for the military occupation of Austria. Austria protested openly and declared that she had to give in to brute force; Hitler thereupon issued a statement that the Austrian assertion about a German ultimatum had been a complete and badly-invented lie, as Austria had asked him for the entry of German troops.

On March 13, 1938, Hitler ordered the new, National Socialist Austrian government to force President Wilhelm Miklas of Austria to abdicate and to conclude the Anschluss. The new law was passed, and on March 15 Hitler personally proclaimed the Anschluss in Vienna. The new Austrian chief of government, Seyss-Inquart, was made governor, but was at the same time subordinated to a

reich commissar, Josef Bürkel, who had been brought in from Germany.

A few months later the name "Austria" was officially obliterated. The country had lost its historic name, and was divided up into the so-called Danube and Alpine provinces (Gau). At the same time, forced re-armament and economic exploitation were started on a grand scale, but with that the currency and the economic structure of the country were completely destroyed. The men who had led the struggle for Austrian independence as well as the officials who had remained faithful to their duties and the constitution were almost without exception sent to prison or concentration camps.

Persecution of Jews, especially in Vienna, began on a very large scale in Nov. 1938; the plundering was legalized under the name of "Aryanization."

Every open opposition was stamped out, but very soon secret resistance movements began to rise. They were suppressed with bloodshed again and again, and counted thousands of victims. When World War II broke out the Austrians were distributed among various contingents, so that the so-called Ostmark units never contained more than a minority of Austrians, and were never led by Austrian officers.

The Austrian resistance movement both at the front and at home grew steadily throughout the war. It drew its strength from all former political parties, and paid a very heavy toll of lives. The outside world did not hear about Austria or even the Ostmark, as if the country and its people had ceased to exist.

After heavy aerial attacks, especially against Vienna and some other cities, eastern Austria with Vienna was liberated in April 1945, by the Red army, the western parts of the country by the forces of the western Allies. (See WORLD WAR II.)

The universal free parliamentary elections held on Nov. 25, 1945, showed the same relative distribution of political strength as had existed in the country before Hitler's aggression: a majority of the (Catholic) People's party (1.574.537 votes and 85 seats), a Social Democrat party of almost the same strength (1,420,562 votes; 77

Austria. Sta	itistical Data, 1938	
ltem -	Value (000's omitted)	Amount or Number
Exchange Rate United States		schilling = 18.82 cents* 26.5 schillings = £1*
Finance National debt	. \$736 (£151)	
Transportation Railroads		3,685 mi. 42,121 " 311 "
Corr munication Telephones		281,790
Minerals Lead	:	10,229 tons 69,445 " 2,866,049 " 319,667 lb.
Crops Potatoes Fodder Beets (1st crop) Sugar beets Red clover Rye Wheat	:	3,589,640 tons 2,469,483 " 1,248,575 " 982,700 " 651,570 " 486,225 "
Livestock Poultry Swine Cattle Forest Products—Total Sawn wood Round wood		9,383,000 2,871,500 2,596,100 132,460 loads† 58,973 " †
*1937. † 1st 10 months of 1937.	-	/-· 1

seats); and a numerically unimportant Communist group (175,471 votes; 3 seats). A coalition government (8 People's party; 6 Social Democrats; one Communist), under the leadership of the Agrarian, Leopold Figl, administered the country with dexterity and resourcefulness. Dr. Karl Renner was elected president of the second Austrian republic on Dec. 20, 1945, and on Jan. 7, 1946, the new government won diplomatic recognition from the Big Four powers—the United States, U.S.S.R., Great Britain and France. The liberated, but as yet occupied, Austria awaited the promised day of freedom. (See also Allied Control Commission for Austria.)

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Austrian Literature

See CENTRAL EUROPEAN AND BALKAN LITERATURE.

Authors' League of America, Inc.

See Societies and Associations.

Autobiography

See American Literature; English Literature; etc.

Autogiro

See Aviation, Civil.

Automobile Industry

In the automobile industry the decade 1937-46 encompassed the most cataclysmic changes experienced during the 50 or more years of the industry's history. The first year of the decade, 1937, saw an output of passenger cars in the United States, which had been exceeded only once, in 1929, and a production of motor trucks equalled only in 1946, the last year of the decennium.

In the second year of the decade, the industry suffered the most drastic recession in peacetime production ever to occur in a comparable period of time. The 1938 output of passenger cars declined nearly 49% and motor trucks 45% below 1937.

Passenger car production in 1937 was 3,915,887 units and in 1938 was 2,000,985, while motor truck output decreased from 893,085 in 1937 to 488,100 units in 1938.

In 1939, a revival occurred in the demand for new vehicles, raising passenger car output 43% and trucks 45%. The recovery continued in 1940 and the first half of 1941, when the impact of war in Europe and the defense preparations in the United States made it necessary to begin curtailment of production of civilian articles, because of shortages in several raw materials and of the need for plant facilities for armaments production.

Hitler's attack on Poland, Sept. 1, 1939, stimulated the U.S. war department to begin mechanization of the army. Before the end of 1939, 6,188 motor vehicles were delivered to the U.S. army, and to 'Great Britain and France. Hitler's continued successes created feverish rearmament programs in Great Britain and France which stimulated in considerable measure the industrial activity of the United States by placement of large orders for war and industrial articles in 1940. Particularly after Dunkirk, when the German motorized armies had demonstrated the power of blitzkrieg, the U.S. government became sufficiently alarmed over the sinister turn of events to begin a complete

mechanization program for the army. In June 1940, Pres. Roosevelt created the National Defense Advisory committee to expedite the entire rearmament program of the United States and to co-ordinate the purchases and requirements of Great Britain, Canada and other democratic countries with those of the United States. This program, together with the direct purchases by the future allies, resulted in the production and delivery of 53.389 military vehicles in 1940 and 218,880 in 1941.

In addition, several motor vehicle and parts manufacturers accepted orders to produce other war products than military vehicles to the extent to which plant facilities and equipment were usable or adaptable. Nearly all these early projects required redesigning and engineering changes so as to make them suitable for mass-production methods. These alterations and adaptations consumed a great deal of time despite the feverish efforts exerted to speed up preparations and get into production of the finished articles. By Dec. 31, 1940, the U.S. automobile industry had produced and delivered \$23,286,000 in aircraft engines and aircraft parts, \$338,000 in guns, \$17,016,000 in diesel engines for submarines, \$187,000 in ammunition components and \$1,293,000 in other war articles in addition to \$115,863,000 in military vehicles.

A considerable amount of the early war work, especially of aircrast components, was stimulated by the activities of the Automotive Committee for National Desense, which was organized Oct. 25, 1940, by the industry itself to stimulate participation in the national desense program.

In 1941, a number of large war projects requiring new plants and special equipment was undertaken by the industry for the mass production of armoured tanks, aircraft engines, complete aircraft and guns. Some of these new facilities began actual production of finished armaments during the summer of 1941. The output of war products continued gaining momentum during 1941 so that by the end of that year the industry had turned out a cumulative total of \$1,091,137,000. Of this, \$201,619,000 was aircraft, aircraft engines and aircraft subassemblies; \$61,616,000, tanks; \$118,232,000, marine products; \$27,866,000, machine guns and other weapons; \$645,307,000, military vehicles and parts; \$25,008,000, ammunition; and \$11,787,000 miscellaneous war products.

The impact of this growing rearmament program, along with that of the nation as a whole, was such that it became necessary to curtail production of motor vehicles for civilians in order to conserve critical imported materials for reserve stockpiles in event war developments shut off supplies from abroad, such as rubber, tin, chromium and tungsten, and to channel a greater proportion of the iron and steel into war articles. Hence, in July 1941, a schedule of curtailed output of passenger cars was imposed by the U.S. government under its war emergency powers, providing for a tapering off of production so that the average for the year ending Aug. 1, 1942, would be about 50% lower than the 1941 model year. By the end of 1941, the rate of actual production had been reduced to approximately the 50% level.

Full Conversion.—The unexpected attack by Japan on Dec. 7, 1941, brought the United States directly into the war as a fighting ally; within a few weeks U.S. government plans were completed for conversion of the automobile industry to 100% war production. Execution of plans followed with a number of successive steps.

First, normal sales of all new motor vehicles were banned after Jan. 1, 1942. All new or used 1942 models remaining unsold, and those still to be produced, were placed in a so-called "pool" for rationing under government control.

Units

23!

Second, production of passenger cars and light commercial cars was ordered stopped after fabrication and assembly of parts and materials on hand before Feb. 10, 1942. Production of medium-sized trucks (9,000 to 16,000 lb., gross vehicle weight) for civilian use was discontinued by March 31 and heavy trucks (above 16,000 lb., gross vehicle weight) for civilian use by May 31, 1942. Production of essential replacement parts was permitted at the rate of output during the first six months of 1941, which was at record levels. Later this was stepped up to 150% of that base period.

Third, orders for armaments exceeding \$5,000,000,000 in value were placed with the automotive manufacturers for aircraft, aircraft engines, aircraft subassemblies and parts, armoured tanks, machine guns, cannon and other artillery, ammunition, armoured cars, personnel and weapon carriers and other military vehicles, and miscellaneous war products. These orders were in addition to the nearly 5,000,000,000 orders that had been placed with the industry prior to that time.

Fourth, a branch office of the War Production board was established in Detroit to aid manufacturers in that area to convert plants and equipment and to obtain the new facilities required in getting into production, with the minimum of delay.

Anticipating the moves by the U.S. government, leaders of the automotive manufacturing industry organized the Automotive Council for War Production on Dec. 30, 1941, as an organization for co-operative action in producing war materials for the military agencies of the U.S. government and its allies. In a resolution at its first meeting the following pledge was made: "The nation will not lack for one gun, one tank, one engine, that the capacity and ingenuity of this industry's producers can add to the forces of our nation and its friends on all the fighting fronts."

The Automotive Council for War Production undertook to aid manufacturers during the conversion of plants and facilities engaged in peacetime production of automotive products and some war materials, to a 100% capacity basis on war products. Speed was of the essence. Problems were referred to committees of experts chosen from the motor vehicle and parts-manufacturing companies. Information and "know-how" on mass-production methods, time-saving techniques, product improvements, tooling short-cuts and other methods were exchanged at meetings or plant visits where demonstrations could be observed.

Similar methods were used throughout the war in expediting war production.

The staff of the Automotive Council for War Production disseminated the results of the meetings to all other manufacturers in the industry, and in many cases to others outside the industry. Machine tools not needed by any company were reported to the Automotive Council for War Production, and other companies were notified by bulletins of their availability. Purchases or loans were then made directly between companies. Also, tool and die shops reported idle capacity in their establishments to the Automotive Council for War Production, which published a weekly consolidated report, and again direct contacts were established between interested parties. Bulletins were likewise issued giving information on parts which prime contractors wished to subcontract to other manufacturers. The Washington office of the Automotive Council for War Production reported promptly to manufacturers, orders issued by the various war agencies that affected the indus-

Armaments Production.—The effective teamwork of the motor vehicle, parts and tool and die manufacturers

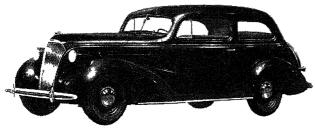
Table 1.- War Production by the U.S. Automotive Industry

Units of War Equipment Produced by the U.S. Automotive Industry During World War II

	Units
Engines Aircraft	455124
Marine	455,124 168,776
Tank	257,117
Military truck	3,250,000
•	
Total	4,131,017
Tanks and Military Trucks	
Combat tanks	49,058
Amphibian tanks	5,115 24,147
Gun carriages (tank type)	24,147
Gun carriages, (other) and armoured cars	126,839
· Sub-total combat units	205,159
Military trucks	2,600,000
Total	2,805,159
Complete geroplanes	22,160
Helicopters	219
Gliders	4,290 255,518
Aircraft propellers	255,518
Jettison fuel tanks	86 <i>5</i> ,000
Guns	
Carbines and rifles	3,388,897 2,276,204 156,313
Machine guns and sub-machine guns	154 212
Others	125,527
Total	5,946,941
Small arms ammunition	12.500.000.000
Shells	12,500,000,000 243,000,000
Shot	1.800.000
Bombs	5,150,000
Anti-submarine ammunition	780,000
Rockets	2,850,000
Torpedoes	5,289 2,480,000
Buzz bombs	1,292 1,177,000 274,000,000
Rocket motors	1.177.000
Fuses	
Cartridge cases	315,000,000 7,525,000
Containers, shell, rocket, mine, cartridge	7,525,000
Ammunition boxes	2,080,000 58,500,000
Ammunition belt links	2,620,000,000
Shell extractors	1,228,000
Ammunition link loading machines	64.000
Parachutes, mine	55,000
Anchors, mine	28,000
Ammunition hoists, navy	415
Drop boxes (via aeroplane)	28,000 1,000,000
Squad tents	11,000
Comforters	390,000
Heimers	20,870,000
Identification disks	
Buckles	150,000,000
Field ranges	62,200
Cook and stock pots	76,000 34 7
Air raid sirens	50 136 000
Fire pumpers	50,136,000 39,539
Fire extinguisher pumps	2,196,000
Helmet liners	10,000
Fire extinguisher	252,000
Searchlights	1,550
Binoculars	1,550 207,400 16,500
Indirect vision device	648,400
Radios	118000
Radar computer units	2,600
Reels, communication wires	2,600 4,753,000 8,418
Marine tractors	
Motor tugs	3,025
Life rafts and floats	13,000
	9,002 1,460,000
Cylinders, gas	4,313,000
Submarine nets (miles)	100
Gyrocompass	5,500

Source: Automobile Manufacturers' Association

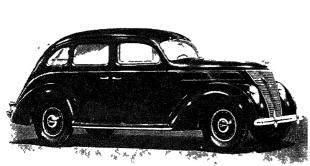
NOTE: Although this list includes all the major items, it is not a complete list of "end products" produced by automobile, body and parts factories, nor does it reflect the huge volume of output of components such as aircraft subassemblies and vehicle parts.



Chevrolet two-door sedan, 1937



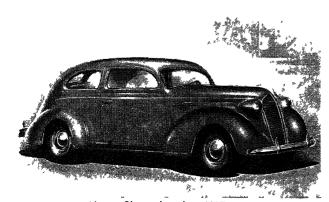
Chevrolet sedan, 1946



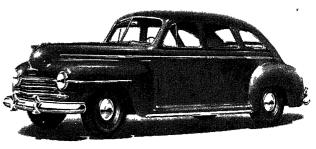
Ford V-8 four-door sedan, 1937



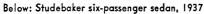
Ford "Sportsman Convertible," 1946

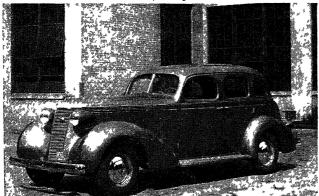


Above: Plymouth sedan, 1937



Above: Four-door Plymouth sedan, 1946





Below: 1947 Studebaker five-passenger coupe with a nine-foot span of rear window glass



throughout the war years resulted in greater contributions to an earlier end of the war than would have occurred without such co-operation. After closing down all plants producing civilian products for complete conversion to war production on or before Feb. 10, 1942, the industry began the herculean task of tearing up assembly lines, rearranging and relocating usable machinery and equipment, changing and rebuilding all machines which possibly could be utilized in war production, placing orders for 1aw materials and additional machine tools and getting their delivery on schedule, training new and old employees for different types of work, generally requiring greater precision than those in peacetime, and adopting engineering changes in the designs of weapons to make possible their mass production. Progress was at such a pace that by August the rate of operation, measured in dollars, had equalled prewar peak levels. The increase in output of military vehicles and other war production carried on simultaneously with civilian motor vehicle and parts production, together with the output of new government-financed plants built and operated by the industry prior to February, made this record possible. The rate of war production continued climbing rapidly during the following year, after which production began to level off or even decline because of adequate supply. Aircraft production, however, continued climbing.

The motor vehicle and parts industry, with the government-financed plants built and operated by the industry's manufacturers, produced an aggregate of approximately \$29,000,000,000 of war materials, not counting the provision of facilities for the production. It was estimated that the automotive industry produced one-fifth of the total output of war materials turned out by all the metal-fabricating industries of the United States.

Rationing.—As part of the government's general program of conserving all supplies required directly or indirectly for the over-all war effort of the United States, passenger cars, trucks, gasoline and rubber tires and tubes were rationed to persons doing work most essential to the winning of the war.

The stock of new cars and trucks remaining unsold on Jan. 1, 1942, and those produced thereafter were placed in a so-called "pool" and rationed to certain eligible classes.

New passenger cars were rationed, after proof of need, to certain eligible classes: doctors; veterinarians; visiting nurses; ministers; persons needing cars for ambulances, fire-fighting, police work, public health and safety work, U.S. mail service, taxicabs and highway work; executives and workers in war plants, etc.; persons hauling newspapers for wholesale delivery; the American Red Cross and a few other types of essential users.

Motor trucks were likewise rationed to civilian persons who could prove need in connection with transportation of commodities and services classed as most essential to the prosecution of the war. Of course, the military agencies throughout the war provided for their requirements by orders placed with truck manufacturers.

Conservation of the stock pile of natural rubber became imperative. Until synthetic rubber could be improved to the point where it would serve as a satisfactory substitute for the natural product, and until plants and equipment could be built on a scale large enough to supply the huge war demand, the meagre inventory had to be channeled into the most important war uses. Hence, rationing of natural rubber for the production of new tires and recapping of old tires and also the rationing of the new tires and tubes to the most essential motor vehicle users was ordered by the U.S. government. Thanks to the ingenuity

of all whose responsibility it was to direct the creation of a new industry, the supply of synthetic rubber became available in adequate amounts on time to keep the passenger cars, trucks and busses rolling at the limited wartime mileages considered necessary.

As the juggernaut of war gathered momentum, gasoline for military vehicles, combat tanks and planes, and fuel oil for warships and transports were needed in ever greater quantities. Vast as was the capacity of the American petroleum refining industry, it, nevertheless, became necessary to curtail the use of this commodity by motor vehicle users. Rationing for civilian users was put into effect in the 17 eastern states on May 15, 1942, and in the remainder of the United States on Dec. 2, 1942. Sufficient gasoline was allowed each owner to continue his necessary mileage provided he joined in a "driving club." This was an arrangement among car owners to take turns in using their respective cars in driving to and from work, or in driving children to and from school. Surveys of war plants indicated that 69% of workers used automobiles in getting to work. Public transportation agencies could not take care of transportation requirements of war workers. Motor truck and bus owners, under the spur of the Office of Defense Transportation, were required to eliminate unnecessary mileage by forming joint delivery schedules, avoiding duplication of routes, loading to practicable capacity and reducing frequency of deliveries, or by utilizing other gasoline conservation plans approved by that wartime transportation authority.

Soon after the United States entered the war, the government adopted a wage and price stabilization program which included a so-called "ceiling" on prices of new passenger cars, trucks, busses, replacement parts, accessories, repairing of vehicles, gasoline, transportation rates and other automotive categories, based on maximum prices charged during a previous period of time. Adjustments of prices were provided for in special cases, and, in the instance of new vehicles sold from the "pool," a monthly price increment of 1% was allowed to cover storage and maintenance costs. (See also PRICE ADMINISTRATION, OFFICE OF; RATIONING.)

Motor Vehicle Registrations.—It was fortunate indeed that the consumer inventory of motor vehicles, particularly of passenger cars, consisted of a relatively high proportion of new vehicles produced in years just prior to the entry of the United States into the war, thereby enabling the industry to concentrate fully on production of war materials throughout the war period. It became necessary to resume production of only a small number of civilian trucks and busses during the war period to take care of urgent transportation of war products and of war workers. The number of passenger cars in use at the beginning of the war was 27,600,000, after eliminating cars scrapped from the registration total of 29,524,000. It was estimated by Charles L. Dearing of the Brookings institution that a minimum of 20,000,000 passenger cars was required in the United States in order to maintain an efficiently-functioning economy. Surveys of war plants later indicated that more than two-thirds of war plant workers depended on automobiles for transportation between home and factory. In some instances, 80% to 90% rode to work in automobiles, participating in "share ride clubs" where each rider took his turn in furnishing the automobile, to conserve gasoline and rubber tires as well as the car.

Although the total number of motor vehicles in use dwindled with the progress of the war, part of the de-

cline in registration totals was explained by the storing of passenger cars without registering them, until gasoline supply or rubber tires would again become readily available at or toward the end of the war. The re-registration of automobiles put in storage at the beginning of the war accounted for the smallness of the decrease in 1944, and the slight increase in 1945 and also for most of the large gain shown in 1946, as indicated in Table II.

The lowest registration point reached during the war, in 1944, with 25.572,842 passenger cars, was still considerably above the minimum of 20,000,000 set by the Brookings institution as the critical point. Automobile owners during the war learned that they could prolong the life of their cars by better maintenance and more careful driving. The rationing of gasoline reduced greatly the annual mileage driven per average car, by perhaps 50%. Instead of an average of 9,000 mi. annually in prewar years, the per car average in 1943, 1944 and first half of 1945 was approximately 5,500 mi. per year.

Motor truck registrations at the lowest point (1943) during the war showed a decline of only 400,000 units, or 8%, below the prewar peak. The tremendous demand for all forms of transportation to haul industrial, agricultural and war products to where they were needed, necessitated keeping on the highways and streets every vehicle that could possibly be reconditioned or repaired. Some passenger cars were converted into goods-carrying vehicles, and a limited production of new civilian trucks was permitted. By means of gasoline rationing, the use of trucks in hauling certain types of commodities was reduced. Other conservation measures also contributed to the maintenance of nearly all trucks in operation at the beginning of the war in active service throughout the war years.

Table II.—Motor Vehicle Registrations in United States

of Dec. 3	•														Passenger cars	Truck
					(Ir	۱ t'	101	JSQ	nd	ls c	٥f	un	ıts)			
1937															25,450	4,25
1938															25,262	4,22
1939															26,201	4,41
1940															27,435	4,59
1941															29,524	4,85
1942															27,974	4,60
1943												٠			26,019	4,48
1944										٠					25,572	4,51
1945										٠		٠			25,691	4,83
1946p											÷				27,068	5,42

Wartime Highway Transport.—World War II demonstrated the vital importance of truck transportation in an economy of mass production with its highly specialized manufacturing processes. Raw materials, semi-finished products and finished parts had to be hauled, often great distances, to factories using them in further processing or assembly into finished articles, and then the final distribution to ultimate consumers. Delivery schedules had to be maintained all along the line to avoid disruptions affecting large segments of the economy.

The speed and flexibility of motor trucks did yeoman service in keeping war production lines in operation. Trucks were dispatched to carry the emergency products on over-night trips that would have required several days by the normal transportation agencies. On other occasions emergency products were hauled by truck over distances of 1,000 mi. or more to keep desperately needed armaments moving out of factories on their way to the fighting fronts.

Another field of special transportation service where the truck demonstrated efficiency was in the transportation

of semi-finished parts or subassemblies produced in one plant but required in another plant, 15, 50 or 100 mi. distant, for assembly into a finished end-product as part of the mass-production process. Small plants often located in towns not readily accessible by other means of transportation, and at times not accessible at all by other transportation methods, were utilized as subcontractors by large and small prime contractors in the production of one or more parts of a gun, bomber or other armament; these plants could draw upon local skilled labour with adequate housing and local means of going to and from work. This extension of the assembly line beyond the one factory was not peculiar to war production, although it was used more intensively during the war period than in peacetime. It had been used before the war in a great many factories employing the progressive manufacturing techniques originally developed by the automobile-manufacturing industry.

The day-in and day-out job of hauling by truck, aside from the above-described services, still continued to be the usual trucking of commodities from farm to city, from factory, store or farm to railroad station or pier on the water routes, and in opposite directions; from home to home, and countless other combinations in the movement of goods.

These vital services of truck operators were carried on despite handicaps resulting from the war. Because Japan cut off the normal supply of rubber, conservation of rubber and rubber tires and rubber inner tubes became imperative. Because gasoline was consumed in greater and greater quantities by the engines of war, it became necessary to conserve the supply of motor fuel. Truck operators, consequently, were called on to co-operate in the saving of rubber and gasoline by reducing the frequency of deliveries of less essential articles of common use, by loading vehicles to practicable capacity, by joining shipping pools to reduce or eliminate duplication of routes, and by other methods.

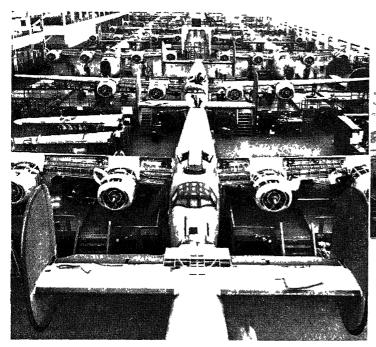
Estimates by the U.S. Public Roads administration indicated that the aggregate mileage driven by motor truck operators declined somewhat during the war years, because of mileage conservation measures. The average load, however, increased considerably, so that total ton-mileages hauled annually during the war were approximately the same as in prewar years, combining all types of trucking operations. The for-hire truckers hauled tonnages aggregating 75% to 90% above the totals moved during the prewar period of 1938 to 1940.

In Combat.—The vital services of motor trucks in combat areas was graphically described in a bulletin issued by the Office of the Chief of Transportation, Army Service Forces, European Theatre of Operations, of the U.S. army:

In the actual invasion, trucks played a major role. Transportation Corps drivers were depended on to get the supplies through, and storming from the maws of LSTs (Landing Ship, Tanks), wound their sloshing way through water and sand to gain the beachheads. After the initial assault in which the Germans were driven back from their fortified pill boxes and gun emplacements, an even heavier task confronted the truck companies.

More troop ships landing demanded more supplies and a never-ending ribbon of motorized equipment worked on an around-the-clock schedule. A gap from the front lines to the beaches had to be bridged, and only motor vehicles could do the job. There were no railroads to bear part of the burden. Everything had to be brought up by trucks, and swiftly.

Reconversion.—In anticipation of the war's end, the contract termination committee of the Automotive Council for War Production began making plans for the day when Germany and Japan would capitulate and war contracts would be cancelled en masse. The most expeditious

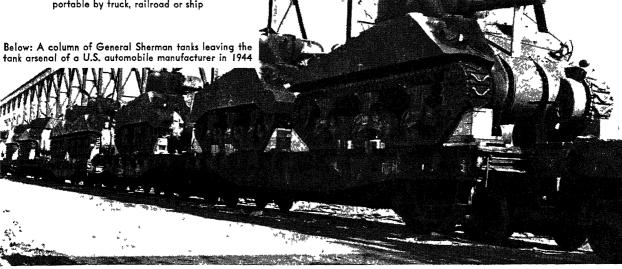




Above: Anti-aircraft guns (40-mm.) made by a U.S. automobile manufacturer, in operation aboard a carrier of the U.S. fleet

Left: B-24 Liberators on the production line at Willow Run, Mich., huge bomber plant built by Henry Ford and completed in 1942





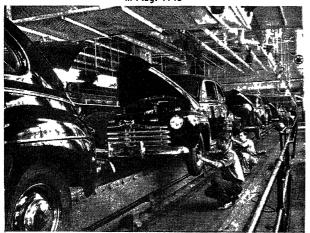
methods for handling the deluge of paper work made necessary by this wholesale cancellation of war contracts was developed in co-operation with the U.S. government's contract termination agencies during the winter and spring of 1945. Plans were made for the prompt removal of government-owned machine tools, equipment and materials from the industry's own plants and the removal of the industry's equipment from the government-owned war plants, so as not to disturb any production activity that might be necessary to continue beyond the day of the cease-fire order.

Individual manufacturers made plans for the acquisition of new equipment needed to replace the peacetime machinery worn out by the war work or sold to other manufacturers. This pre-reconversion planning enabled manufacturers later to make the transition from war production to their respective peacetime activity in the least possible time, and much more smoothly than if this foresight had not been exercised.

Shortly after the German capitulation in May 1945, the government cancelled some of the war contracts held by former passenger-car manufacturers, thereby making possible the resumption of passenger-car production on a small scale while continuing the production of the war products required for the defeat of Japan. The War Production board, after consultation with industry representatives, allocated a quota of 241,916 passenger cars to manufacturers in proportion to the prewar base period output, but modified to provide a minimum practical schedule for the smaller manufacturers. This quota was for the period ending Dec. 31, 1945. Another quota of 449,102 cars was allocated for the three months ending March 31, 1946, taking into account the advantages allowed smaller companies for minimum operating rates during the earlier period. The total allotment of cars was limited by the amount of steel and other materials available above those required for the continuing production of war articles and other civilian products.

The ban on production of civilian passenger cars was removed July 1, 1945, by the War Production board. Several hundred cars had been produced by the time Japan capitulated. After the defeat of Japan, manufacturers encountered the expected deluge of contract cancellations. But, because of the thorough pre-conversion planning, the huge volume of paper work required and the physical

Ford cars starting to roll off an assembly line in Detroit, Mich., in Aug. 1945



task of removing and rearranging machinery and reconstructing assembly lines proceeded with anticipated celerity.

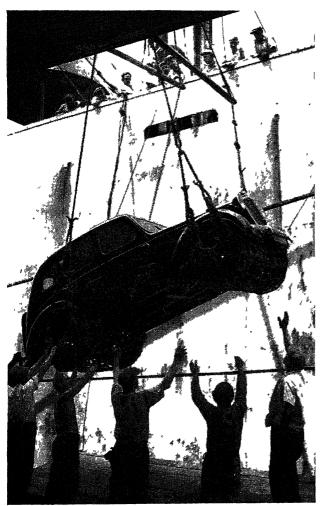
Passenger-car production schedules reported to the War Production board after the end of World War II indicated that manufacturers expected to produce a total of 500,000 passenger cars by Dec. 31, 1945; but only 83,792 were actually turned out. The manufacturers had expected to produce about 2,800,000 by June 30, 1946, but only 725,824 were actually constructed. The reasons for this disappointing development were ascribed to the shortages of various materials such as glass, textiles, pig iron and steel, and lack of an adequate flow of parts and components for the cars such as transmissions, gears, wheels, bearings, because of strikes in supplier plants and work stoppages in passenger-car manufacturing and assembly plants. The shortages of materials were greatly aggravated by the general strikes in steel manufacturing, coal mining and railroad transportation and to a limited degree by the strikes in electric utilities plants.

Reconversion of the truck-manufacturing and the automotive-parts plants, except those building passenger-car bodies, was a simple task compared to that of the passenger-car manufacturing branch of the industry. Physical alteration of the facilities used in producing transport and combat vehicles in the truck factories was negligible by comparison. The problems concerned principally the termination and settlement for inventories of materials and work in process that could not be used in production of civilian trucks.

Civilian truck production had the advantage of a running start when the Japanese war ended because the War Production board had earlier in the year allocated a large civilian program to the truck makers, accompanied by allocations of necessary materials. The actual production of civilian trucks during the last four months of 1945 was handicapped by shortages of materials and components such as axles, gears and transmissions caused largely by strikes in supplier plants. The rate of output during the latter part of the year was estimated at only 50% of actual practical capacity. Despite this, a total of 313,643 civilian trucks were built during the year in addition to the 354,-935 military vehicles produced, mostly prior to the war's end.

As the turbulent decade drew to a close, the automobile industry was still struggling to reach prewar levels of production, but the year 1945 produced only an estimated 2,170,000 passenger cars. Unlike passenger-car manufacturing, truck makers turned out a new record total of 950,000 trucks for civilian use.

Golden Jubilee.-The final year of the decade, 1946, marked the 50th anniversary of the beginning of the automobile industry, during which more than 91,000,000 vehicles had been produced in the United States. This event was fittingly celebrated by a golden jubilee in Detroit. The events, among others, considered significant in the development of the automobile were: March 6, 1896-Charles B. King was the first to drive his horseless carriage on the streets of Detroit; April 2, 1896-Barnum and Bailey's circus exhibited a Duryea motor wagon as the stellar attraction of its parade; May 30, 1896-A horseless carriage race in New York city was sponsored by John B. Walker; June 4, 1896-Henry Ford successfully drove in his first automobile in Detroit; Sept. 7-11, 1896—World's first motor vehicle track race at Narragansett park, under auspices of Rhode Island state fair; Sept. 12, 1896-1000 mi. endurance race for automobiles from Paris to Marseilles.



First British postwar automobile sent overseas, an Austin four-door sedan, being lowered onto a New York pier on its arrival from Liverpool in July 1945. The delivery marked a reopening of peacetime trade between Great Britain and the U.S.

A parade of more than 200 of the oldest vehicles still in existence, a pageant of early Detroit history, and a dinner honouring living pioneers, served to commemorate the event.

In England, the motor industry celebrated the 50th anniversary of the "Locomotives on Highway Act of 1896" which made the driving of motor vehicles up to 12 mi. per hour legal. An act passed in 1878 had required that a vehicle be preceded at 20 yd. distance by a person on foot. Although no British motor vehicles were produced at the time, the Act of 1896 did encourage pioneers to enter the field, in competition with imported German and French automobiles.

British Production.—With the war striking both the United Kingdom and Canada immediately after Hitler's invasion of Poland, the impact of war production affected the output of civilian passenger cars and trucks earlier than in the United States, especially in England. Passenger-car production in England was practically eliminated in 1940, but production of transport vehicles was increased considerably in that year, establishing a new high output of 133,700 units, exclusive of armoured trucks. The output of motor trucks continued at nearly this record level throughout the war period.

Output of civilian motor vehicles was resumed in England in 1944, when a total of 2,100 passenger cars and

130,844 motor trucks were produced. In 1945, 16,938 passenger cars and 122,467 motor trucks were produced. In the first 7 months of 1946, 99,534 passenger cars and 79,499 motor trucks were produced. Of the latter totals, 46,808 passenger cars and 26,249 trucks were exported, representing 47% of the former and 33% of the latter. This compared with the exports for the 12 months ending Sept. 30, 1938 of 22% for passenger cars and 15% for trucks.

Passenger cars in use toward the end of 1938 were 1,819,-376; motor trucks 483,865; and hackneys 83,977. Registrations indicated a total of 1,473,742 passenger cars, 478,-056 motor trucks or goods vehicles, and 104,401 hackneys in use as of Nov. 30, 1945, according to the Society of

Table III .- Production of Motor Vehicles in Great Britain (Number of units)

															Passenger Cars	Motor Trucks and Busses
1937															389.633	118,116
1938															342,390	105,171
1939															304,575	97,884
1940															Ì	133,700*
1941		٠		٠			٠	٠	٠						Ť	127,100*
1942															No production	124,900*
1943						٠			٠			٠			No production	121,600*
1944								٠	٠	٠	٠	٠			2,100	130,848*
1945															16,939	122,467
1946	(1:	it 7	7 п	105	1	٠					٠		٠	٠	99,534	79,499

*Excluding armoured trucks. †1940 and 1941 production of civilian passenger cars was not available but was probably very small Source. United States Department of Commerce.

Motor Manufacturers and Traders, Ltd. At the end of the war, there had occurred a decrease of 345,637 passenger cars and 5,809 goods-carrying vehicles. But the total number of hackneys (busses and taxicabs) had increased by 20,424.

Canada.—In Canada, production of passenger cars for civilian use was discontinued during the spring of 1942, although operations had continued on a reduced scale up to that time. Production of motor trucks for civilian use continued on a greatly reduced basis during the war period, with only 4,088 trucks turned out in 1943 and 9,113 trucks in 1944.

The use of passenger cars in Canada reached a peak of 1,280,000 at the end of 1941. The decline during the war

Table IV.—Production and Registration of Motor Vehicles in Canada (In thousands of units)

								Proc	luction		Registration						
								Pass. car	s Trucks*	Total	Pass. cars	Trucks	Total				
1937								153	54	207	1,103	206	1.309				
1938								124	42	166	1,160	223	1.383				
1939								108	47	155	1,190	237	1,427				
1940								110	82	192	1.235	253	1,488				
1941								97	53	150	1.280	279	1,559				
1942								12	27	39	1.217	291	1,508				
1943								0	4	4	1.194	302	1,496				
1944								Ó	9	9	1,178	310	1,488				
1945								2	45	47	1.160	321	1,481				
1946	(1s	19	m	os.	.)			64	57	121	†	†	†				

Trucks produced for civilian use. ource: Dominion Bureau of Statistics.

Table V.-Factory Sales of Motor Vehicles from Plants in United States (Units are shown in thousands, values are shown in millions.)

							rasseng	er cars n	meter trucks and busses				
							Units	Wholesale Value	Units*	Wholesale Value*			
1937							3,916	\$2,304	891	\$542			
1938		٠		٠			2,001	1,270	486	338			
1939							2,667	1,816	704	498			
1940							3,692	2,422	722	539			
1941							3,778	2,674	862	720			
1942							223	174	184	210			
1943	٠						No p	roduction	25	42			
1944							No p	roduction	115	184			
1945							70	61	289	368			
1946†			٠				2,170	‡	950	‡			
						-							

Civilian vehicles only. Estimate based on production for 1st 10 months. Source: Automobile Manufacturers' Association.

was relatively small, showing a loss of only 120,000 units. Truck use, on the other hand, continued increasing throughout the war period, from 253,000 in 1940 to 321,000 at the end of 1945.

The output of military vehicles by motor vehicle plants in Canada was reported by the Dominion Bureau of Statistics as 762,395 for the years 1940 to 1946 inclusive. (See also Accidents; Business Review; Disasters; Insurance; Motor Transportation; Petroleum; Roads and Highways.)

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Automobile Insurance

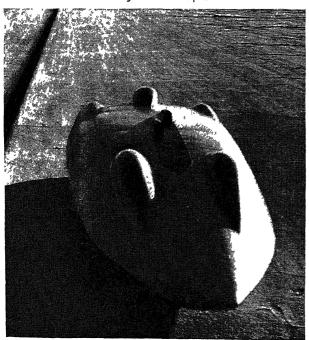
See INSURANCE.

Automobile Racing

Ten years of auto racing during the period 1937–46 could not be considered an accurate yardstick of the acceptance or achievements in the sport because at least half of these years saw most events requiring rubber tires and gasoline cancelled in deference to war shortages.

The decade opened auspiciously with a world land speed mark being broken by Captain George E. T. Eyston of England over a measured mile on the Bonneville Salt

John Cobb speeding over the course of Bonneville Salt Flats, Utah, Aug. 23, 1939, when he broke the world's land speed record, driving at 368.85 m.p.h.



Flats in Utah, U.S.A. Captain Eyston drove his "Thunderbolt" at an average speed of 911.42 m.p.h.

Again in 1938, Captain Eyston was the outstanding figure in auto racing. Eyston whizzed through a measured mile at 357.5 m.p.h. in September over the Bonneville Salt Flats. He thus erased the mark of 350.2 m.p.h. established 24 hours previously by John R. Cobb, a London fur broker.

Cobb, however, made another successful assault upon the world's land speed record in 1939. He streaked through a measured mile on the Bonneville Salt Flats on Aug. 23, at 368.85 m.p.h. By travelling more than six miles a minute Cobb thus regained the world's straight-away speed throne which he had held the previous year for a brief span of 24 hours. He drove a 2,600 horse-power 24-cylinder aluminum "Railton Red Lion."

Oblivious of gathering war clouds, a syndicate of wealthy Americans constructed and opened Roosevelt raceway in Westbury, Long Island, N.Y., in 1937, and revived the Vanderbilt Cup race, which was won by a German driver, Bernd Rosemeyer. He drove his rear-motor "Auto Union" to victory over his English rival, Richard Seaman. With the advent of World War II the horse replaced the automobile, and Roosevelt raceway was transformed into a harness racing track.

Midget auto racing continued to prosper, and more than 50 tracks were active during the early part of the decade, six of them forming an eastern circuit and operating under A.A.A. sanction.

The annual 500-mile Indianapolis Speedway classic continued to be the principal U.S. automobile racing event until it was discontinued in 1942 after U.S. entrance into World War II. The 1937 event was won by Wilbur Shaw of Indianapolis in 4 hr., 24 min., 7.8 sec.—an average of 113.58 m.p.h. Floyd Roberts of California won the 1938 race at a record average speed of 117.20 m.p.h., and Shaw repeated his 1937 performance by taking first place in 1939 at an average speed of 115.035 m.p.h. In the latter race Roberts was killed-the Speedway's first fatal accident after 1935. By capturing first place again in 1940, at an average of 114.277 m.p.h., Shaw became the first man in the 28-year history of the event to win two years in succession. The 1941 race was noteworthy in that two drivers piloted the first-place car-Mauri Rose of Indianapolis, Ind., and Floyd Davis of Springfield, Ill., who maintained an average speed of 115.117 m.p.h.

The war years brought an abrupt halt to any further auto racing until 1946, when the Indianapolis classic on May 30 was won by George Robson in 4 hr., 21 min., 16.70 sec., maintaining an average speed of 114.820 m.p.h.

(T. J. D.)

Avery, Sewell Lee

Avery (1874-), U.S. business executive, was born Nov. 4, 1874, in Saginaw, Mich. He was graduated from the University of Michigan law school in 1894. He became eastern sales manager of the U.S. Gypsum company in 1901 and president of the organization four years later. In 1931, he also became director of Montgomery Ward & Company. A militant opponent of the New Deal, he attained national prominence in 1944 when he refused to obey orders of President Roosevelt and the War Labor board in a labour dispute, and the army took over possession of the Montgomery Ward plant. At the time, Avery refused to leave his office and two soldiers had to carry him out bodily.

Late in Dec. 1944, Avery again defied President Roosevelt and the WLB and a series of strikes swept the Ward

plants and stores; the army again seized the company's plants in Chicago and in six other cities. Roosevelt declared that the company would not be allowed to set aside government wartime policies "just because Mr. Sewell Avery does not approve of the government's procedure for handling labour disputes." Avery replied that "Ward's cannot in good citizenship accept or obey the commands of those who have no legal power to give them." On Jan. 27, 1945, Avery won partial vindication when a federal district judge in Chicago ruled that government seizure of the Ward plant was illegal. On April 27, 1945, Avery was re-elected chairman of Montgomery Ward.

Aviation, Civil

The rapid shift from peace to wartime operations, the fulfilment of seemingly impossible demands of a world at war, and reconversion to meet peacetime needs—these were the main chapters in the story of civil aviation from 1937 through 1946.

By 1937, civil aviation was already well established. Extensive services had been inaugurated, and except for a gap between Manila and the continent of Asia, a traveller could circle the globe by scheduled air transport. Technical progress had resulted in such developments as the NACA (National Advisory Committee for Aeronautics) cowl, the cantilever wing and high octane gasoline. That year saw the appearance of aircraft which were still doing yeoman service in 1946.

Despite its progress, aviation was a youngster beset with growing pains. The lack of navigation aids confined transport operations in a large part of the world to daylight hours and good weather. Air service across the Atlantic was limited to infrequent zeppelin trips. Many of the technical advances were still in an experimental stage; others, while practicable, had not attained general use. Notwithstanding its tremendous strides, civil aviation still had not attained its greatest development.

Chronology of Scheduled Air Transport.—In 1937, Imperial Airways, a British company, vied with Pan American Airways (P.A.A.), sole United States international carrier, for honours as the world's largest air line. Imperial, connecting England with many of its possessions and the members of the commonwealth, operated to Europe, South Africa, India, Hong Kong, and through connections with Quantas Empire Airways, an Australian company, linked Great Britain with Australia. Pan American conducted services between the United States and the Latin Americas, Hawaii, the Philippines and local services within Alaska.

Also operating long-range international services were Air France, K.L.M. (Royal Dutch Airlines) and the German companies, Deutsche Lufthansa and Deutsche Zeppelin Reederei. Air France operated to points in Europe, Africa, Asia and South America. The major route of K.L.M. outside Europe was to the Netherlands East Indies. Lufthansa flew the South Atlantic to Brazil, and Deutsche Zeppelin conducted dirigible service across the South and North Atlantic.

In domestic operations, the U.S. led the world, with a

system having 31,084 unduplicated route miles and carrying an average of 3,400 passengers each day. Canada, lacking a transcontinental route, had numerous north-south services connecting the southern portions of the country with the isolated north. In Latin-America, companies owned by nationals were appearing, but most services were rendered by air lines controlled by foreigners, with Germany extremely active.

In Europe, virtually every nation had one or more air lines, usually government-controlled. Internal services were, on the whole, incidental to international operations; however, domestic services did exist. England had some 17 transport companies. Russia, with two state air transport administrations, G.U.G.V.F. (Aeroflot), and G.U.S.M.P., reported extensive services throughout the U.S.S.R., including routes in the Arctic and Iar east. But Germany was generally credited with the most complete internal services.

Australia had approximately 14 companies connecting the principal cities; in Asia, China had three—China National Aviation, jointly owned by the Chinese government and Pan American; Eurasia, controlled by German interests; and Southwest Aviation corporation, entirely owned by Chinese.

During 1937, plans for North Atlantic service with heavier-than-air craft began to take shape when Pan American, Imperial, Air France and Lufthansa started surveys and P.A.A. and Imperial began service between the U.S. and Bermuda. P.A.A. inaugurated a Manila-Hong Kong service, and by extending service to Paraguay, linked by air all capitals of the Latin American republics. The formation of Trans-Canada Airlines, controlled by the government, marked the first step toward the 3,000-mile Canadian transcontinental service.

Friction between Russia and Germany caused dissolution of a joint company which had operated Moscow to Berlin after 1921. However, after the Russo-German nonaggression pact in 1939, service between Moscow and Berlin was resumed by Aeroflot and Lusthansa, continuing until June 1941. On May 6, 1937, the German zeppelin "Hindenburg" burned while mooring at Lakehurst, N.J., after an ocean crossing, killing many aboard. Although Germany planned to convert the "Hindenburg's" sister ship from hydrogen to noninflammable helium, the refusal of the U.S., the sole source of helium, to release any of the gas caused abandonment of the Atlantic service.

Expansion of both domestic and international air services continued in 1938. International route extensions included the linking of Brisbane and Sidney on the London-Australia route and the opening of Batavia to Sidney service by Royal Dutch Indies Airlines, giving the Netherlands an Amsterdam-Australia route. Air France extended to Hong Kong, and Lufthansa began service to the middle east. The Canadian transcontinental route came nearer to realization when Trans-Canada inaugurated daily mail service between Vancouver and Montreal.

In 1939 expansion resulted both from years of planning and wartime contraction. During the summer the long-awaited North Atlantic route became a reality when Pan American inaugurated service between the U.S. and Europe via the Azores and via

Table I.—Selected S	tatistics for U.	S. Domestic Sch	reduled Carriers

Year						Route Miles	Passen- gers Carried	Passenger Miles Flown	Mail Ton Miles Flown	Cargo Carried (Ib.)	Aircraft in Service	Total Fatal ities
1937						31,084	1,102,707	476,603,165	6,698,230	7,127,369	282	52
1939						35,213	1,876,051	749,787,096	8,584,891	9,514,229	265	12
						41,915	4.060,545	1.491.734.671	12,900,405	19,209,671	359	44
1943						36.982	3,454,040	1.642.596.640	35.927.042	57.543.591	194	30
1945						51,433	7,502,538	3,500,102,057	64,955,466†	83,024,000	411	88
1946*						53,879	6,085,238	2,651,813,056	18,701,488†	49,044,000	593	68

^{*}First six months. †Provisional. Source: CAA.

Newfoundland, the latter route planned only for operation during summer months. Imperial followed with transatlantic mail service.

Table II.—Selected Statistics for U.S. International and Territorial Scheduled Carriers

Year		Passen- gers Carried	Passenger Miles Flown	Mail Carried (lb.)	Cargo Carried (Ib.)	Aircraft in Service	Total Fatal- ities
1937		139,955	58,255,487	426,261	1,114,008	104	14
1939		168,970	86,031,146	675,422	1,397,956	74	14
1941		320,065	185,214,555	1,637,361	3,105,416	94	2
1943		437,957	284,008,915	4,064,142	16,314,498	79	14
1945		492,792	467,065,137	4,368,850*	15,006,952*	97	27

*Does not include Colonial Airlines, Caribbean-Atlantic Airlines and Hawaiian Air Lines. Provisional. Source. CAA.

The outbreak of World War II caused suspension of numerous services of European carriers. Many were soon revived, but some, such as Lufthansa's South Atlantic operation, were permanently suspended, and others, such as Imperial's North Atlantic service, remained inoperative for considerable lengths of time. Typifying conditions in the warring nations was the British government's assumption of complete direction of air transportation and elimination of nonessential services, leaving only the empire life lines and five railroad-controlled domestic companies.

In addition to the North Atlantic operation, 1939 witnessed other expansion. Trans-Canada began service between Vancouver and Moncton, completing the transcontinental route. The privately-owned Canadian Pacific Railway entered the aviation field, and by 1942 had merged into one organization, Canadian Pacific Airlines, all important north-south feeder routes in Canada. In December, Lati, an Italian government-controlled company, inaugurated Atlantic service to Brazil, an operation that continued until Brazil denied gasoline supplies after the U.S. entered the war.

Table III.—Selected Statistics for Canadian Civil Aviation

Year					Passengers Carried	Passenger Miles Flown	Mail Carried (lb.)	Freight Carried (1b.)
1937					114,953	11,874,769	1,450,473	26,279,156
1939					161,503	26,107,750	1,900,347	21,253,364
1945					540,101	146,653,504	6,713,894	14,286,284
S	•	٠	_	 ٠	Burney of Ch			

During 1940, Pan American established a regular San Francisco-New Zealand service, began nonstop flights to South America and operation of the inland cut-off across Brazil, which reduced flying time between New York and Buenos Aires to three and one-half days, and inaugurated regular summer service between Alaska and the U.S. The latter supplied an unbroken route extending from Alaska to Argentina. P.A.A. also continued its important Atlantic service, but the U.S. Neutrality act necessitated ending trips outside the war zone. A second U.S. transatlantic service became assured when American Export Airlines, a new company, was certificated. Imperial and British Airways were merged into the government-owned British Overseas Airways corporation (B.O.A.C.), which undertook operation of all British international services.

Table IV.—Selected Statistics for British International Scheduled Carriers

	Route	Passengers	Passenger	Cargo Carrie	d Mail Carried
Year	Miles	Carried	Miles Flown	(tons)	(tons)
1937*	28.654	81,365	53,306,395	746,994	1,242,153
1944-45† .	56,615	103,804	197,947,494	6,077.82	2,816,25
1945~46† .	66,716	143,950	295,839,835	5,166.67	2,873.62
(provisional)					•

*Imperial and British Airways (calendar year). †B.O.A.C. (year ending March 31). Source "Selected Statistics for World Air Carriers," CAB: Reports, B.O.A.C.

Tasman Empire Airways, a joint British, Australian and New Zealand company, inaugurated New Zealand-Aus-

tralia service, forging a new link in the international chain-connecting New Zealand with the empire services, and Australia with Pan American's direct route to the

Table V.—Selected Statistics for Australian Regular Air Transport Services*

Year	Route Mileage	Passengers Carried	Passenger Miles Flown	Mail Carried (lb)	Cargo Car- ried (lb.)
1938-39		99,511 525.025	42,901,209 256.011,792	5,674,234	1,555,301
	eas service	sTrans-Tasn	nan Sydney-Sin	gapore, Sydney	v-Karachi.

The fall of France and the entrance of Italy into the war caused radical changes in the air transport picture. Air France fell into obscurity. K.L.M., most of its equipment destroyed, flew what was left to England and continued operations, maintaining its East Indies service with trips terminating at Palestine. To preserve the empire life line to the east, B.O.A.C. inaugurated flying boat service via Lisbon, Portugal to Lagos, in west Africa, where a connection was made with the established routes across Africa to Egypt and the east. This operation was supplemented the following year by a Pan American route across central Africa, established to supply the British forces in Egypt.

Lufthansa took over services in the occupied countries and continued flights to Lisbon, where, until the end of the war in Europe, its planes landed at the same field as those of the United Nations. Sweden, the only country outside the axis orbit left with extensive European services, operated intermittently to Austria, England, Germany, Hungary and the U.S.S.R.

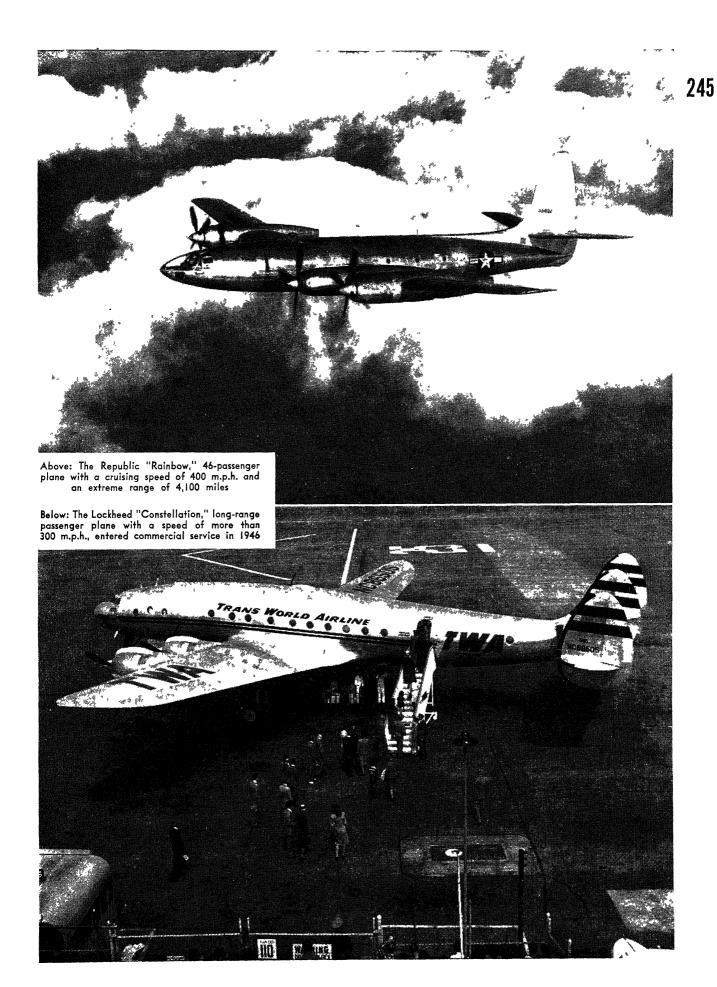
In the far east the Chinese Central government, involved in the war with Japan, took over Eurasia, subsequently called China Air Transport; and Hamiata, a joint Sino-Russian company organized in Dec. 1939, operated limited service from Hami, Sinkiang, to Alma Ata, where it connected with Aeroflot.

England's Atlantic passenger service was finally established in 1941 with routes serving military purposes between England and the U.S. via Africa, and between England and Canada, via Newfoundland. The latter service, undertaken by B.O.A.C. as an adjunct of the bomber ferrying service pioneered the preceding year by the British ministry of aircraft production and Canadian Pacific Airlines, served to return ferry pilots from England to Canada. This operation marked the first service on a year-round basis over the so-called "summer route," which only a few years before was considered impossible during winter months.

The Japanese attack on Pearl Harbor confronted U.S. air lines with their greatest test. Despite the loss of aircraft and personnel to the armed forces and the undertaking of extensive military operations under contract, the domestic air lines, by elimination of nonessential traffic stops and increased efficiency, were able to maintain their civilian services. Operations of the domestic carriers for the following year saw mail and cargo ton-miles almost doubling, and passenger miles declining only slightly.

Entry of the U.S. into the war precipitated the elimination in Brazil of Sindicato Condor. This completed efforts begun several years before to expel German-controlled air lines from South America and to replace their services by those of U.S. or national companies.

The war further disrupted international routes in 1941 and 1942. Pan American's commercial Pacific services fell victim; Dutch services in the East Indies ceased, and Dutch aviation centred around its Caribbean services and contract operations for B.O.A.C. from the British Isles



to Lisbon. British services to the far east ended at Calcutta, India, with the New Zealand-Australia route cut. China National Aviation pioneered the "Hump" route over the Himalayas to India to preserve China's main communication with the Allied Nations.

In 1943, U.S. air lines inaugurated daily commercial all-cargo flights between New York-Los Angeles and New York-San Francisco, the first transcontinental service of this type. Although cargo flights between some points had begun as early as 1940, and four U.S. air lines had formed a joint company to study cargo carriage in 1941, this type of service remained a minor part of the business of the scheduled air lines.

During 1943, 1944 and part of 1945, most air transport throughout the world concentrated on the war efforts of the various countries, operating directly for the armed forces or conducting civilian services under military priorities. With the ending of World War II the contribution of these services to victory became fully known.

With the conclusion, early in 1945, of the major part of the direct war operations for the army and navy, it was revealed that U.S. air lines in those operations had flown a distance exceeding 26,000 trips around the equator, in services extending to all parts of the world. In addition to these spectacular operations, the air lines had trained personnel, and maintained and modified aircraft for the armed forces. Also revealed were the heroic stories of the regular trips of British and U.S. pilots across Africa, forming a vital link with the British forces in Egypt; of the 1,200 trips of B.O.A.C. over axis areas between

The Boeing Clipper, giant transoceanic passenger plane which began scheduled flights from the U.S. to Europe and the orient on June 28, 1939. Civilian service was interrupted by World War II when the Clippers were enlisted as military transports

London and Stockholm, Sweden; in an effort to maintain the supply of vital ball bearings for the aircraft manufacturing industry; and of the 3,523-mile over-water flights of the Australian airmen between that continent and Ceylon, relinking the empire route cut by the Japanese.

No account of wartime transport operations, however, would be complete without mention of the transport services of the armed forces. Although military operations, their effect on civil transport, and the part played in their conduct by personnel of civilian companies linked them inextricably with civil aviation. Starting in 1942, the U.S. army's air transport command (q.v.) developed into the largest air line operation ever known. By the end of the war, the ATC had a fleet of 2,789 modern transport aircraft operating to every part of the world. Between July 1942 and V-J day, 7,000,000,000 passenger miles, 2,333,-000,000 ton miles, and 900,000,000 plane miles were flown. Also conducting widespread operations was the U.S. naval air transport service, which developed into a system utilizing 435 planes and, at its peak, having more than 75,000 miles of routes. The British R.A.F. transport command accomplished similar feats in its world-wide operations.

The liberation of important areas and approaching victory made possible re-establishment in 1944 of some commercial routes which had been inoperative after the early days of the war. Among these was the British London-Paris service, the "blue ribbon" route of prewar days.

Not until 1945, however, did the widespread resumption of commercial operations occur. Although service was limited, routes between the major European cities were reestablished. In the field of long-range operations, B.O.A.C. resumed England-Australia service, and in conjunction with South African Airways, began operation of an England-South African route. K.L.M. resumed service to Batavia for the Netherlands government. During the year,

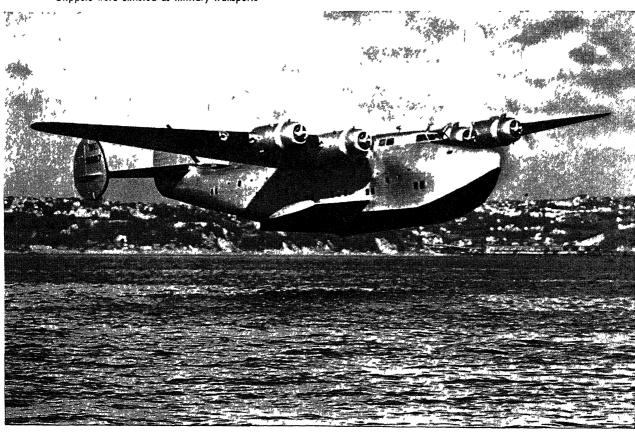


Table VI.—Approximate Flying Times and Fares

												London	to Paris	New York	to London	San Francisco	to New Yo	York San Francisco to Manila		
												Flying Time (hours)	Fare* (dollars)	Flying Time (hours)	Fare* (dollars)	Flying Time (hours)	Fare* (dollars)	Flying Time (hours)	Fare* (dollars)	
1937					. ,							1-35	\$22.00	Not Ina	uaurated	16 45	\$160.00	130 00	\$799 00	
1939				,	. ,							1 15	20 00	45 00	\$375 00	1605	149.50	127 15	739 00	
1946				`								1.15	28.00	15 40	325.00	1235	118.30	75 15	726.00	
*Fares	d	٥ ١	no	t i	ncl	ĺυ	de	g	ΙΟV	er	nm	ent tax.								

Trans-Canada for the first time began carrying paying passengers over its Atlantic route, begun in 1943 for the government as a mail and cargo operation.

In the United States, consideration of proposed new routes deferred during the war was resumed, and three U.S. air lines (Pan American, T.W.A. and American Overseas, successor to American Export and controlled by American Airlines) were awarded Atlantic routes extending as far as U.S.S.R. and India, with service to be inaugurated as soon as conditions permitted. These authorizations marked the large-scale entry of U.S. domestic air carriers into the international field. Important additions were made to the domestic network. With route mileage increased to approximately 67,000 miles, it was estimated that 82% of the urban population lived within a 25-mi. radius of the certificated routes in 1945. In October, the elimination of the system of military priorities, in effect from 1942, was a milestone in the return to peacetime operations.

The year 1946 was one of great development. By late fall eight air lines, American Overseas, T.W.A., Pan American, B.O.A.C., Air France, K.L.M., Trans-Canada, Danish Airlines (D.D.L.) and Swedish Intercontinental Airlines (S.I.L.A.), were operating an average of more than eight round trips a day across the North Atlantic.

In western Europe, routes as extensive as the prewar network were in operation, and only the lack of equipment and gasoline prevented services from exceeding those of 1939. Many changes, however, had occurred. Gone was the Lufthansa, with Germany banned from all aviation activity, and in Italy hopes for scheduled transport rested in two companies, one controlled by Italy and B.O.A.C., and the other by Italy and T.W.A. In eastern Europe, many of the prewar companies had also disappeared, to be replaced by companies controlled by the national governments alone, or jointly with the U.S.S.R. Even by the summer of 1946, services between eastern and western Europe had not begun again on a prewar scale, though Prague and Warsaw had numerous connections. Aeroflot, however, had expanded its prewar European services by connecting Moscow with the eastern European capitals and Germany.

B.O.A.C. had not only resumed all prewar intercontinental services, but was operating additional ones, and British South American Airways, a new company, was operating a priority service to Latin America. Air France, with its international routes restored, and Panair do Brazil, a Brazilian company of the Pan American system and a newcomer to the transatlantic field, were competing with B.S.A.A. across the South Atlantic. In the Pacific, Pan American resumed its services and Australian National Airways began service for the Australian government from Australia to Canada pending the completion of plans for a joint British, Australian and New Zealand company for a transpacific route.

Many South American countries were fostering national companies, and in 1946 two Colombian air lines were authorized to operate to the U.S. Trans-Canada was offering not only transcontinental and transatlantic service, but also frequent flights to seven U.S. cities including New York city, Chicago, Ill., and Seattle, Wash.

The immediate postwar U.S. international picture was completed when Pan American was authorized to extend its Pacific services to India to connect with its Atlantic route, giving it a

service circling the globe, and was certificated to operate another route across the South Atlantic to Capetown. A second round-the-world route was set up by extending Trans-World Airline's European route to Shanghai, and Northwest Airlines' services from the U.S. to the same point via Alaska. Still other extensions gave Braniff Airways a route to Buenos Aires and extended several other operators to the Caribbean area. But despite considerable progress, the inauguration of service over many portions of these routes was still distant at the end of 1946.

The U.S. domestic air lines, freed from wartime controls and with an ever-increasing supply of equipment, expanded services in all categories. The number of trips between such cities as New York and Washington, D.C., increased to more than 57 round trips daily, and transcontinental schedules, making only a refueling stop en route, were inaugurated. Strenuous efforts were being devoted to air cargo, with slashes in rates, simplification of rate structure, institution of contract services and acquisition of specially-equipped cargo aircraft.

The postwar pattern of the U.S. domestic system also began to emerge when several small companies were authorized to conduct local and feeder services, linking the less-thickly populated communities with each other and with the major trunk lines. This type of service had been pioneered by All American Aviation, Inc., in 1940, when it began a mail "pickup" feeder service. Intrastate lines, operating scheduled services wholly within a single state, began for the first time to appear in numbers.

Nonscheduled and Miscellaneous Services.—Despite the increases in scheduled operations before World War II, nonscheduled, charter, taxi, sightseeing and miscellaneous services in many countries employed a substantial portion of all civil pilots, mechanics and aircraft. During the war these services were greatly curtailed or eliminated, but they again played a big part in the expansion of civil aviation after the war.

The unprecedented expansion of nonscheduled commercial air carrier postwar service in the United States comprised one of the major events for the ten-year period in that country. Pioneered by veterans with priority to purchase surplus military transport planes, these operations developed the most extensive civilian air cargo business ever seen, transporting a wide variety of commodities, many of which had never before moved in volume by air. In addition to cargo, the "nonscheds" conducted extensive passenger operations, graphically portrayed by the estimate that during the resort season of 1945-46, more passengers per day left La Guardia field, N.Y. for Miami and Palm Beach, Fla., by nonscheduled carriers than by the scheduled lines. With equipment ranging from light single-engine planes to four-engine DC-4s, these operators covered the U.S., flew to South America and across both the Atlantic and the Pacific. One of them flew a load of 50,000 eggs from the United States to Warsaw; another flew 306 employees of a Philippine government agency, plus some 3 tons of equipment, from California to the Philippines.

In the United Kingdom, nationalization of the scheduled services, left nonscheduled, charter and miscellaneous services the only fields open to private enterprise. In Sept. 1946, more than 50 charter services existed in the United



Interior of an Avro York, transport version of the Lancaster bomber, accommodating 12 to 56 passengers and in service with the British Overseas Airways corporation. B.O.A.C. routes connected Grect Britain with points in Europe, Africa, Asia and Australia

Kingdom. Canadian nonscheduled carriers, renowned for the part they played in building up Canadian aviation, particularly in the northern sections, continued their activities under government regulation.

An operation in the U.S. planned by several small companies after the war, was an air ambulance service. New to the U.S., this type of operation had long been used in several other countries, notably Australia. The Australian flying doctor service, financed by private contributions and government funds, furnished ambulance service and medical aid to isolated "out-back" settlers. In 1946 it covered half the area of Australia from a chain of seven main bases, each equipped with radio communication facilities.

Another world-wide service was aerial photography. Before the war, aerial photography had proved its value in such activities as mapping and soil conservation work. In 1937, a program of photographing some 68,420 sq.mi. of the United States "dust bowl" was completed. Aerial photography played a vital war role, with the armed services using it extensively as a strategic and tactical aid. A military program which was of value to civilian aviation was the aerial mapping of 19,000,000 sq.mi. of world airways by the U.S.A.A.F. Notable wartime developments in aerial photography included the automatic electric flash unit for night photography, colour photography for greater detail, photography from as high as 40,000 ft. and the radar camera.

Well established in Canada, where mining companies had used their own planes for many years, company ownership and operation of aircraft for the movement of personnel and supplies was becoming widespread in the U.S., especially by concerns having factories scattered throughout the country. Aerial services also continued to be useful in farming, especially crop dusting, forest and wildlife conservation, city planning, air advertising, etc.

Private Flying and Training.—Although private flying and training ordinarily had constituted two distinct, though related aspects of civil aviation, the two became largely identical during a major part of the ten-year period; in wartime the activity of the private pilot was interwoven with military training.

For many years prior to World War II, the governments of most European countries showed great interest in private flying, promoting it through subsidies. The British commonwealth countries had subsidy programs for their aero clubs carried out primarily through the grant of a bonus for each pilot certificated. In the U.S., although there were many private training schools and probably more private flying than in any other country, no government aid was given until 1939, when the civilian pilot training program was established in schools and colleges.

With the outbreak of war, private flying in most belligerent countries was grounded, and planes were taken over by the military. But the activities of the civilian pilot, though changed, continued. England, in Sept. 1939, organized the air transport auxiliary which utilized civilian pilots to ferry aircraft from factories to R.A.F. stations, principally in the British Isles. Having some 1,500 pilots, the A.T.A. delivered approximately 340,000 aircraft. In Canada, civilians of the aero clubs and commercial aviation concentrated on the operation of elementary flying and air observer schools for the British commonwealth air training plan set up in Dec. 1939 and based in Canada to train men from all parts of the commonwealth and empire.

Table VII.—Canadian Certificated Civil Aircraft and Pilots

Year																								Aircraft	Pilots
																								604	1,157
1939	٠	٠	•		٠	•	•	٠	•	٠	•	•	•	٠	•	٠	٠	•	•	٠	•	٠	•	488	1,299
1945																٠	٠	•	٠	٠	٠	٠	٠	381	1,427
Sour	·ca	. 1	ca	na	dia	'n	Ru	rei	711	Λf	S	tat	icti	rs.											

Entry of the U.S. into World War II substantially reduced pleasure flying in that country also. Civilian pilots found their places as instructors in civilian schools, training personnel for the armed forces. They also staffed the Civil Air Patrol, an organization performing such necessary military functions as coastal and border patrol, courier service, tow target and tracking work and rescue and relief work.

With the end of the war, private flying began to resume peacetime activities. Australia continued the prewar plan of assistance to the aero clubs. Private flying was again under way in Canada, led by the aero clubs, under their title of "Royal," awarded by the government in recognition of war services. Although lack of aircraft and airports and the high cost of the available planes impeded widespread resumption of flying, some relief was obtained following the release of surplus equipment and military fields by the government. In the United Kingdom a similar situation prevailed. Civilian activity at the end of 1946 was hampered by the lack of equipment, gasoline shortages, high costs and the abandonment of the govern-

Table VIII.—Australian Registered Civil Aircraft and Pilots

Year																		Re	egistered Aircraft	Pilote
1937-38																			204	1.260
																				1.549
1944-45	٠	٠	٠	٠	٠	٠	٠	•	٠	•	٠		•	•					206	633
Source:	(<u>_</u> 0	mm	on	w	-01	th	R.		~	~ f	: 0	٠.,							

ment aero club subsidy plan. Here also the release of surplus equipment and aerodromes to the clubs helped some. Nevertheless many people felt that sailplanes offered the only immediate solution for private flying.

In 1944, the U.S. government stopped its direct civilian

training program, which in the four years of its existence had instructed 397,812 persons. However, the government was indirectly stimulating private flying both by a veterans' education program and by a tremendous airport construction program.

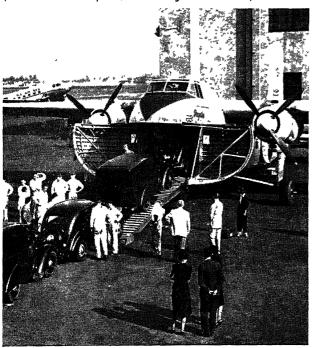
Probably the strongest impetus to private flying came from the return to civilian life of military personnel, many of them trained pilots and most others air-minded. It was clear that private flying, despite some hindrances, was on the threshold of its greatest expansion. Proof of this was the fact that U.S. private plane manufacturers had 40,000 orders at the end of 1945, and despite record production in 1946, still found a substantial demand for new planes at the end of the year.

Table IX.-U.S. Certificated Civil Aircraft and Pilots

Year																	Aircraft	Pilots*
1937																	10.836	17,681
1939																	13,772	31,264
	٠																24,836	100,787
1943																	22,927	122,884
1945	•				٠			•	٠	٠	٠				٠		3 <i>7,</i> 789	182,000
To Sep *Doe: Sour	s n	ot	inc	luc						•	•	•	•	•	•	•	71,551	371,563

Government.—Dwarfing all other government activities in the international field was the International Civil Aviation conference held in Chicago in 1944. The 54 nations at the conference drafted four far-reaching agreements: (1) a convention to set up a permanent international civil aviation organization; (2) an interim agreement to set up a temporary body known as the Provisional International Civil Aviation organization (P.I.C.A.O.); (3) a "transit agreement"; (4) a "transport agreement." The last two set up the "five freedoms" of the air enabling the aircraft of a country to fly over and land in other countries for nontraffic purposes, to take on or discharge in such countries passengers originating in or destined to the homeland of the aircraft, and to take on in one foreign country passengers destined for another foreign country. By the fall of 1946, 12 nations had deposited ratifications of the

The Bristol twin-engine cargo plane shown during a loading demonstration at La Guardia field, N.Y., on Sept. 19, 1946. Britain's first postwar commercial plane, it was designed to land a 6,000 ton load



permanent convention, 46 the interim agreement, 29 the transit agreement and 15 the transport agreement.

Limited acceptance of the transport agreement left traffic rights between most countries to be settled through bilateral agreements. In 1946, numerous such agreements were concluded, including that reached at the Bermuda conference between Great Britain and the U.S.

In 1945, P.I.C.A.O. was established in Montreal; the first meeting of the assembly was held in 1946. Regional conferences called by P.I.C.A.O. were held in 1946 to develop an efficient system of navigational aids for international use. By the end of the year, important recommendations of these conferences were under consideration.

Also growing out of the Chicago conference, though not a governmental organization, was the International Air Transport association, successor to the prewar European International Air Traffic association. Its purpose was to provide machinery for co-operation between international air carriers. By the end of 1946, agreement on international rates and standardization of traffic procedures had been facilitated through I.A.T.A.

In individual countries, national governments assumed a major role in civil aviation. The U.S. government avoided ownership or management of air services, relying on regulation of private enterprise. With only safety supervised in 1937, the Civil Aeronautics act of 1938 provided comprehensive safety and economic regulation. Administration of the act, originally vested in a Civil Aeronautics authority, was subsequently divided between two agencies, the Civil Aeronautics board and the Civil Aeronautics administration. Among other things, the CAB was given responsibility for controlling economic matters, including authorization of new routes and the fixing of rates, promulgating safety regulations and accident investigation; the CAA, for enforcing the safety provisions, licensing airmen and aircraft, developing and maintaining airways.

In the administration of the act, major government policies emerged. The authorizing of American Export Airlines to operate Atlantic services in addition to those of Pan American evidenced the intent to have competition among U.S. international services. Requiring American Export's steamship parent to divest itself of control of that air line in effect barred surface carrier participation in international and interstate services. The certification of several small new companies pointed to a network of trunk lines operated by the large carriers, and local or feeder lines by smaller regional carriers. A major problem remaining in 1946 was that of the nature and extent of the economic regulation that should be exercised over nonscheduled carriers.

In the Civil Aeronautics act, the government committed itself to subsidizing air service by basing payments for the carriage of mail on the financial needs of the carriers, and the major attention of the CAB was devoted to determining such mail rates. Although all certificated carriers originally received payments amounting to substantial subsidies, improved financial results of operation enabled the CAB in 1942 for the first time to reduce the compensation of a carrier below the subsidy level. By 1946 the larger domestic carriers operated without subsidies; however, the international operators and smaller domestic lines still received financial aid. Although possessing powers to fix passenger rates for domestic services, the steady reduction in passenger fares by the carriers obviated the necessity of exercising those powers during the period.

Another important government move came not from

250 the CAB, but the post office. With air mail having always required a substantial surcharge, the post office in 1946 announced the establishment of a five-cent postage rate for air mail inside the U.S. and to its possessions, reducing the surcharge to only two cents.

Despite assumption by the U.S. government of exclusive control over broad phases of aviation, both state and local governments continued extensive activities. These were devoted primarily to licensing and otherwise regulating intrastate services, airport development and co-operation with the federal agencies.

The governments of the British commonwealth nations were equally active. In 1943 and 1944 intergovernment conferences resulted in the establishment of pooling and other co-operative arrangements in the services between the countries and the setting up of the Commonwealth Air Transport council, an advisory body.

In the United Kingdom, the regulation of economic and safety aspects of civil aviation was a function of the air ministry until 1945, when a ministry of civil aviation was established. In prewar years, government participation in air transport was effected through subsidies to private companies. The first direct government participation, except for wartime emergency measures, came with the establishment in April 1940, of British Overseas Airways corporation to operate all external services. This organization was controlled by the government through majority stock ownership. Complete government ownership of scheduled air transport followed in Aug. 1946, with the passage of an act nationalizing existing transport companies and providing for operation of all services by government-owned companies. The plan called for three organizations: British European Airways to operate internal and continental services; British South American Airways to fly Latin American routes; and British Overseas Airways corporation to conduct remaining services.

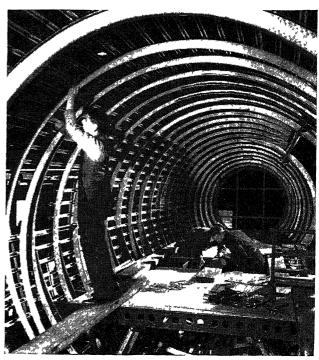
A leader in air mail development, the British government in 1938 completed the famous empire air mail scheme to carry without surcharge all first-class mail between many parts of the empire. Suspended in 1939 because of lack of equipment, the service had not been resumed at the end of 1946.

Australia followed a course somewhat similar to that of Great Britain. The administration of the Air Navigation act and regulations was transferred from the department of defense to the department of civil aviation in 1939. In 1945 a law to nationalize the internal scheduled air carriers was passed. Although the nationalization provisions of the bill were declared void by the high court, the government withdrew its subsidies to private companies and established its own company, Trans-Australian Airways, to operate in competition with them. The government also participated through direct ownership in Australian international companies.

In Canada, with the government already regulating certain phases of civil aviation in 1937, a series of changes in both the nature and extent of government regulations and the modes of administering them resulted in a comprehensive system by 1946. In April 1937, the government began direct participation in air transport with an act to establish and control, through its Canadian National Railways, Trans-Canada Airlines for the transcontinental services. The scope of government activity increased when, in 1944, the government announced the designation of Trans-Canada as the sole operator of internal trunk lines and international routes. Government control of the largest air line did not, however, exclude private companies from the field.

Production.—In 1937 the U.S. was producing mostly civil aircraft, but the European countries, spurred on by Germany, were beginning large-scale production of military planes as rapidly as expanding facilities would permit. At the outbreak of the war in Europe, Germany led in the number of planes produced, with England, despite progress, far behind. Notwithstanding the stimulus to both increased production and a shift to military planes that had come with large orders from Great Britain and France, the U.S. still concentrated on civilian planes and trailed England in volume of production.

By 1944, when peak production was reached, the picture was altered greatly. Production of planes for civilian use had ceased, while the volume of military production had reached staggering proportions. The five large warring nations were together producing approximately 250,-



Fuselage of the British airliner "Hermes," a four-engined passenger plane. It was designed to have a seating capacity of 34-50 persons and a cruising speed of about 240 m.p.h.

000 military planes annually; the U.S. production was nearly double that of its nearest rival. From 1940 to 1944 the numbers of military planes produced in the U.S. increased approximately 1,500% and the airframe weight approximately 4,500%, the greater proportional increase in weight reflecting the shift from fighters for defense and light planes for training to heavy bombers for attack. During 1944, U.S. military aircraft products alone had a value of \$16,745,000,000, while in 1940 both civil and military aircraft products had a value of \$859,866,383. The enormous expansion of the U.S. aircraft industry was illustrated by the fact that the 97,600 employees in Jan. 1940 had grown to 2,079,900 in Jan. 1944.

Table X.—U.S. Aircraft Production—Number of Military and Civil Planes 1937 1938 1939 1940 1941 1942 1943 1944 1945 1946* 3,773 3,623 5,856 12,871 26,134 48,858 85,898 96,318 48,866 13,917

*First six months.
Source: 1937—42, Statistical Handbook, C.A.A.; 1943—44, Aircraft, Engine and ropeller Production, C.A.A.; 1945, Aircraft Industries Associates; 1946, Bureau of

After V-J day, tremendous cutbacks were made, and production dropped sharply. In the United States, military contracts for \$9,000,000,000 worth of aeronautical equipment, including 31,000 planes, were cancelled on a single day. With its great plant capacity, and already producing large numbers of heavy bombers and transports for military use, the U.S. swung into production of commercial transports with relative ease. England, having concentrated on fighter and pursuit planes during the war, and with military orders lasting longer, was slower in converting. Nevertheless, in both countries, production of civilian planes was assuming its peacetime role by the end of 1946. England was relying on her lead in the jet engine industry to offset this initial disadvantage in the production of commercial transports.

Table XI.—British and Canadian Aircraft Production— Number of Military and Civil Planes

1937 1938 1939 1940 1941 1942 1943 1944
Great Britain . . . 2,218 2,827 7,940 15,049 20,093 23,671 26,263 29,220
Canada 110 160 252 904 1,699 3,782 4,133 4,178
Source: Canadian Wartime Information Board, British Information Service.

The methods developed to accomplish the wartime feats were of great importance to postwar civilian production. Undoubtedly mass production was achieved, although, contrary to some early predictions, automotive techniques were not wholly applicable. Standardization, more extensive tooling and a breakdown of operations were outstanding. Two problems left unsolved were the rising cost of production and the length of time required to introduce new models into production.

The foundation of much of the increased production during the war was the construction of government-financed factories. Plans in different countries varied. In some cases the plants were owned by the government and operated by the government or by private industry; in others they were owned by private companies subsidized by the government. After the war, some governments continued participation in aircraft production. The U.S. government, however, which had followed the plan of government ownership and private operation during the war, was selling its plants.

An aftermath of wartime production in the United States was the large number of aircraft declared surplus by the armed forces and placed on sale to civilians. By Sept. 30, 1946, the War Assets administration, the government disposal agency, had net acquisitions of salable aircraft of all types with a reported cost of \$1,421,369,000. Disposal as of the same date amounted to \$770,354,000 reported cost. U.S. surplus aircraft together with lend-lease aircraft comprised a major part of the air line equipment of the world in 1945 and 1946.

Wartime strides in production were not limited to the large industrial nations. Canadian and Australian production, although not comparable in volume with that of the U.S. and Great Britain, showed equally amazing progress. In Australia an embryonic industry, with no general organization and few skilled aircraft technicians, importing most of its raw material and complex components such as engines, and capable at best of turning out only a few light planes, developed into a largely self-sufficient unit able to produce modern transports and front-line fighters and bombers. This growing industry produced 3,526 military planes from Sept. 1939 through Aug. 1946.

The prewar Canadian industry, though already producing one highly successful type of purely Canadian design, the twin-engine Noorduyn Norseman, was a minor industry. With about 3,000 employees in 1939, it grew by 1944

to an industry of more than 120,000 workers, producing a substantial number of military planes, including Lancaster and Mosquito bombers. In 1946, Canada was producing, under licence, DC-4s with Rolls-Royce Merlin engines for use on Trans-Canada Airlines and was expanding jet development and gas-turbine jet-engine work begun during the war in greatest secrecy. Plans were under way for the manufacture of helicopters, and a new Canadian light plane design, the Noury Noranda, had been announced.

Aids to Navigation.—Before 1937, adequate navigation aids were recognized as essential to safe and efficient operation, since only with them could aircraft fly accurately to their destinations and operate safely at night and in bad weather. Throughout the world, experimental work resulted in a multitude of complex systems, confusing to the layman. The prewar U.S. system was probably the most extensive. Its basis was a network of governmentowned and operated airways, with radio range stations, radio marker beacons, weather reporting stations, traffic control stations, teletype service, lighter beacons and intermediate landing fields. The backbone of the airways was the radio range, emitting beams to guide the pilot along his course. Other western hemisphere countries followed the U.S. plan.

Table XII.-- U.S. Federal Airways

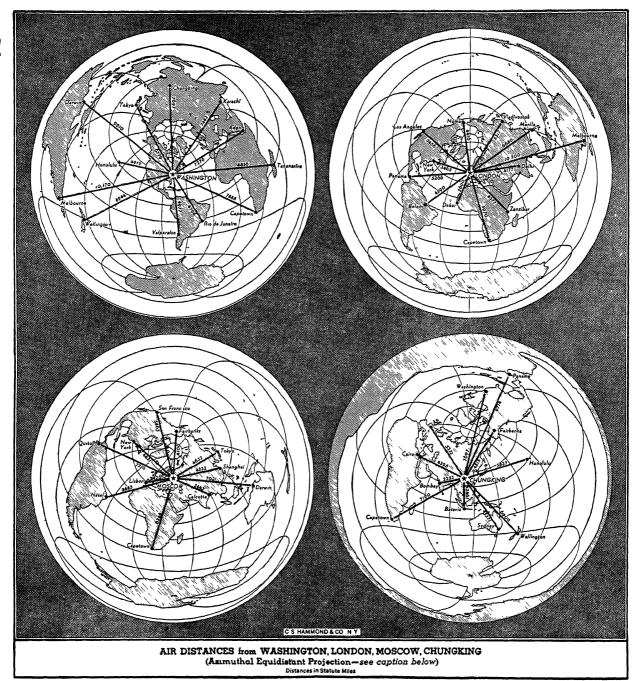
Year	Lighted Mileage	Radio Range Stations	Airway Traffic Control Centres	Weather Bureau and CAA Oper- ated Weather Reporting Airway and Airport Stations, Teletype Equipped
1937	22,319	180	8	271
1939	27,074	244	12	298
1941	32,679	312	15	453
1943	33,403	291	23	365
1945	35,561	304	· 25	533
Source	e: CAA.			

Prewar Europe had no government-designated airways. Systems there were based on the use of radio direction-finding with ground direction-finding most widely used. Ground stations determined the position of the aircraft from radio waves transmitted by airborne equipment and advised the pilot of his position.

It was agreed that the 1937 systems were inadequate because of the limited number of facilities and the technical shortcomings of those facilities. Work in the tenyear period attacked the problem from both angles. A major improvement was the development of very high frequency radio equipment, which was comparatively static free. In 1937, Australia, taking advantage of German experimental work, began the installation of 11 very high frequency radio beacons, and the U.S. in 1941 completed an experimental very high frequency radio range between New York and Chicago. The war interrupted plans for converting all medium frequency ranges in the U.S. With the return of peace, a program to accomplish this was under way.

Another improvement was the omnidirectional range. Unlike existing ranges which supplied four set courses, the omnidirectional range, by means of a rotating radio beam, supplied courses in all directions from the station. In 1946, the United States planned to gradually install omnidirectional ranges on all airways.

Although manually-operated airborne radio direction finders had been in use for some years, it was not until the late 1930s that an effective automatic finder was introduced in the United States. This was followed by the dual automatic direction finder. So efficient were these that in 1941 the CAB, faced with increasing airways congestion,



announced that transports equipped with such devices could fly off the radio ranges.

Much attention centred on instrument landing systems With three types in use at major airports in prewar Europe, efforts were directed to developing still better systems. In 1938, the United States CAA was able to announce an improved scheme, and during the war the armed forces continued this work. One of the war-tested systems was SCS-51, incorporating the CAA principle, and visually portraying on a single instrument in the plane all necessary information for a blind landing. Adopted by Great Britain and the U.S., SCS-51 equipment was being installed at 50 airports and on many transports in the U.S. in the summer of 1946.

Holding greatest promise for air navigation was radar (q.v.). Applied to flight navigation, instrument landing, distance finding and collision prevention, radar offered

Air distances from the capitals of four nations to other important cities shown on azimuthal equidistant projection maps. This type of map, ideal for computing air distances, is centred on a chosen spot (in each of the above four, the capital). A straight line on the map connecting the centre spot with any other spot on the map is the shortest distance between the two points, a great circle route

almost unlimited possibilities. Although radar research dated back to the 1920s and radar detection stations for military use had been erected in England by 1935, the war produced the major radar developments. While most wartime radar devices required further work for commercial application, some were already in use in 1946. One was ground-controlled approach (GCA). Used successfully by the armed forces during the war as an instrument landing system, the immediate civil use of GCA appeared to be as an airport traffic monitoring device, permitting personnel on the ground to locate accurately, through the radar scope, planes in the vicinity of the airport. In 1946,

GCA had been obtained for three U.S. airports. Two radar flight navigation systems used during the war, the short-range British Gee and the long-range U.S. Loran, were also considered capable of immediate application in civil flying.

Each year the increasing number of planes on the airways and at airports made traffic control a more acute problem. To meet this problem the United States completed an airway traffic control program and set up traffic control centres.

Radar devices were looked to as the probable solution to the airport traffic control problem.

The various aids to navigation installed throughout the world for the armed forces in the war were a great boon to civilian flying. The northwest staging route in Canada, completed as a wartime airway providing an inland route to Alaska and Asia, was a notable example.

Technical Developments.—In prewar Europe, governments played a relatively larger part in research and development in their countries than did the government in the United States. In all countries during the war both government and private research was stimulated to unprecedented activity. In the United States the principal government research agency, the NACA, with adequate funds for the first time, assumed an increasingly important role. The postwar pattern for the U.S. and England appeared to be government research, including military research, working closely with the research of the private aircraft industry.

The trend toward larger, faster planes, under way in 1937, continued at an accelerated pace. Already in operation on the air lines by 1946 were 69-passenger, 300 m.p.h. planes, with transports of 400 m.p.h. soon to be in use. Development in transport aircraft during the decade turned to multi-engine landplanes. With increased range and ability to maintain flight with one or more engines inoperative, they were used by 1946 not only for land but also for transoceanic operations, largely replacing the prewar flying boat. After the war, planes designed expressly for hauling cargo were receiving wide attention.

In the light plane field, with production nonexistent during the war except for a few models to meet military needs, the plane of 1937 still dominated the field in 1946. The De Havilland Tiger Moth in the British commonwealth and the Piper Cub in the U.S. were still the major training planes. New designs, however, were appearing, with emphasis on utility for the individual owner. One of the most popular was the spin-proof plane. Offered in 1946 were larger planes with higher horsepower, all metal construction, retractible tricycle landing gears, flaps, improved propellers, better instruments and radio as standard equipment.

Not all emphasis was on conventional aircraft with increased size and speed. Although the idea of incorporating all functions of the fuselage and empennage in the wing had been experimented with for years, practical results were achieved under the impetus of war. In 1946, the XB-35 prototype (Northrup Flying Wing) completed a successful first flight, and Armstrong-Whitworth in England was nearing completion of a jet-propelled tailless transport.

By 1937, the desirability of multi-engine transport aircraft from a standpoint of safety was established, but opinion differed on the most desirable number of engines for planes of different types and purposes. Before the war the German JU-52, a trimotor, was widely used throughout the world for passengers and freight, and the U.S.S.R. had two-, three-, five- and six-engine planes. Although the

U.S. and Great Britain emphasized two- and four-engine equipment, a number of planes with three, six and eight engines were in production in 1946.

Table XIII.—Representative Transport Aircraft

	Number of	and Individual	
Туре	Passengers	Horsepower	(m p.h)
1 <i>937</i>	_	·	, , ,
Short Bros, Empire "C" Class Flying			
Boat (Great Britain)	15-24	4- 790	164
Douglas, DC-3 Landplane (US)	14-21	2—1,000	192
Junkers, JU-88 Landplane (Germany)	10	2-1,140	224
1939			
Short Bros, Empire "G' Class Flying			
Boat (Great Britain)	12-24	4-1,225	180
Boeing, B-314 Flying Boat (US)	40-70	41,500	150
Junkers, JU-90 Landplane (Germany)	40	4-1,000	201
1946 (in use)			
Douglas, DC-4 Landplane (US)	44-56	41,100	234
Lockheed Constellation Landplane			
(U S.)	64-69	42,200	300+
Vickers-Viking Landplane (Great	21-27	2-1,675	210
Britain)	21-27	2 1,0/3	210
1946 (under construction)			
Bristol, Barbazon I, Landplane			
(Great Britain)	50 plus 2 tons of freight	82,500	250
Avro Tudor II Landplane	or neight		
(Great Britain)	60	4-1,660	275
Republic Rainbow Landplane (U.S.)	53	4-3,250	400
•		•	

All countries showed renewed interest in the pusher-type plane. By 1946 such planes, large and small, were being developed and in some cases actually produced. An interesting one was the Douglas XB-42 with propellers in the tail and power plants in the fuselage. This also exemplified the plan of submerging the engines in the fuselage or wing which resulted principally from research to reduce drag. Other notable research to increase performance through reduced drag in the conventional cantilever wing monoplane, the basic design of the period, was done by the NACA. Its accomplishments, particularly in new wing shapes, constituted high points of the decade 1937–46. Also appearing were wings with greater sweep-back, thought to be a partial answer to the problem of compressibility in transonic flight.

A necessary part of the general progress was the development of improved power plants. In 1937, the most powerful engines produced approximately 1,200 horsepower. The need for larger and faster warplanes called for more powerful engines. In the midst of the struggle to meet this need, the controversy over the relative merits of liquidand air-cooled engines reached new heights. Whatever their relative merits, both became widely used, and their horsepower increased steadily. By 1946, a 36-cylinder, 5,000-horsepower, air-cooled engine was announced by a U.S. manufacturer. And these increases were achieved with only slight proportional increases in the weight of the individual units.

Contributing to better performance was the steady improvement in superchargers, especially in the U.S. turbosupercharger. Superchargers developed during the decade increased take-off efficiency and made possible high altitude flight. Another corollary to high-altitude flying was the pressurized cabin, introduced on a commercial plane in 1940 in the U.S.

Experimented with in all countries, the diesel engine found application in Germany's Junkers Jumo 205. The Germans, feeling that the diesel was effective where exceptionally long range and economy of operation were desired, used this engine extensively.

A particularly important development with unlimited potentialities was the introduction of practical jet propulsion. The major advantages of jet engines were held to

be their great power, accompanied by light weight and adaptability to aerodynamic cleanness. Behind jet progress was metallurgical research, producing metals capable of withstanding extreme heat and power stress. A successful jet flight was conducted in Italy in 1940. In May 1941, the first successful jet-propelled aircraft was flown in England. This plane had a gas-turbine jet engine based on a design of Air Commodore Frank Whittle. Produced under wartime secrecy, a model of the Whittle engine was sent to the United States and on Oct. 1, 1942, the first U.S. jet-propelled aircraft was flown. Out of this development came such aircraft as the Gloster Meteor and the Lockheed Shooting Star, fighter planes with speeds exceeding 600 m.p.h.

Germany developed jet propulsion to an amazing degree, particularly rocket propulsion as applied to guided missiles. While U.S. and British research concentrated on the gas-turbine jet engine, the Germans, for military purposes, also developed the intermittent-duct jet engine used in the buzz bomb, V-1; the athodyd, or ramjet, flight-tested in the fall of 1944; and the rocket motor, used in the famous V-2. The advanced position of German rocket research was shown by the fact that at the end of the war Germany was building a pilot-controlled, liquid-fuel rocket powered bomber, planned to fly from Germany to New York in 40 minutes. German research stimulated efforts the world over to achieve piloted flight at supersonic speeds.

The application of the jet principle to commercial planes began to be a reality in 1946. Several types of transports under construction, having conventional reciprocating engines and propellers, utilized the engine exhaust to supply jet thrust for additional power. Although still experimental, the British flew an Avro Lancastrian equipped with two conventional engines and two jet engines, using the conventional power plants for take-off and the jets in flight. Speed with the two jets alone was reported to be 100 m.p.h. greater than with four conventional engines.

Propeller improvements kept pace with engine developments. Propellers so constructed that the pitch of the blades could be changed in flight were in limited use in 1937. By 1946, the controllable-pitch propeller, adjusted by the pilot, and the constant-speed propeller, adjusted automatically, were in general use on large planes. Also brought into general use during the ten years was a feather-

The "Ensign," a low-winged two-seated monoplane designed for private business or recreation flying. Featuring a plexiglass canopy and a practical cruising speed of 112 m.p.h., it was first exhibited in the U.S. in Sept. 1940



ing device which made possible adjustment of the blades to prevent auto-rotation in the event of engine failure. A further extension of the principle of adjustable blades was made in 1944 with the introduction of the reversible pitch propeller, used as a landing brake. Increased size and strength were achieved without proportional increases in weight through the use of hollow steel propellers. Three-and four-blade and contra-rotating propellers, the last consisting of two propellers revolving on the same axis, but turning in opposite directions, were installed on a growing number of planes.

The tricycle landing gear, just coming into use in 1937, was adopted for all larger planes and many postwar light planes. Fast disappearing was the fixed landing gear, replaced by the retractible gear, mechanically drawn into the wing or fuselage during flight.

Metal, particularly aluminum alloys, continued to be the dominant material in aeroplane construction. Fabric, formerly widely used, was relegated to the light plane field. War demands and shortages intensified research into all possible materials and resulted in a return to wood, the introduction of moulded plywood, increased use of plastic, and a variety of metals including stainless steel and magnesium. While flush riveting to eliminate drag caused by exposed rivet heads was being adopted at the beginning of the decade, with the Germans and British leading, this method did not become a standard practice until after the outbreak of war. In addition, various techniques of welding were introduced and widely accepted in aircraft construction.

Recognized as essential to safety and efficiency of operation, devices for the prevention of ice formation on wings, propellers and control surfaces were appearing on transport aircraft in 1937. The most widely used de-icers consisted of pulsating rubber boots at the critical spots. During the war, the U.S. army air forces employed the new, NACA tested "hot wing" de-icing. In 1946, most U.S. transports in production incorporated this principle of thermal de-icing, and its installation on existing transports was planned.

Remarkable changes took place in gliders. Used principally for sporting purposes before the war, the glider became an important military weapon with the advent of aerial warfare. The light, soaring planes became flying boxcars towed by a powered aircraft. The U.S. CG 13A, about the size of a DC-3 and capable of carrying 4,000 lb., was typical of the advanced designs. It was predicted during the war that such gliders would be used commercially for postwar cargo carriage; however, by 1946 this application had received only minor acceptance. (See GLIDING.)

Rotary Wing Aircraft.—Catching the public fancy to as great a degree as any event in the history of aviation was the development of rotating wing aircraft, represented chiefly by the Autogiro and the helicopter. The Autogiro, having a conventional power-driven propeller in the nose and a large rotor above the fuselage, demonstrated its practical application when, in 1939, Eastern Air Lines conducted Autogiro mail service from the roof of the Philadelphia, Pa., post office to the airport.

Major emphasis of the decade, however, was on the helicopter. Lacking fixed wings and conventional propeller, the helicopter with a power-driven rotating wing could go forward, ascend and descend vertically, move to either side or backward, and hover without moving. Its acceptance, speeded with the successful flights in Germany in 1937 of the Focke-Wolfe 61, came still closer when the first U.S. helicopter, a Sikorski, was flown in 1939. Shortly afterward, the U.S. armed forces ordered similar



The helicopter was expected to revolutionize postwar civil aviation and provide a means of mass private transport. Here a helicopter pilot demonstrates how supplies can be dropped to persons marooned in inaccessible areas, or how rescues can be made by rope ladder

craft from several helicopter manufacturers. Used for patrol, search and rescue work by the military services, the practical value of this type of aircraft was established during the war.

CAA certification of a Bell design paved the way for civilian use in the U.S. In 1946, the U.S. post office department conducted successful experimental mail services using helicopters in the metropolitan Los Angeles and Chicago areas. Numerous requests before the CAB for authority to operate helicopter routes indicated a widespread interest in the commercial possibilities.

By the end of 1946, civilian production was under way. Among the many types being experimented with were the familiar design with one main overhead rotor and a small tail rotor; and newer designs with two main rotors arranged coaxially, intermeshed, outboard, or tandem, having power supplied by one or two engines. In England a helicopter was developed utilizing jet to counteract the torque of the spinning rotor. (See also Airports and Flying Fields; Aviation, Millitary; Disasters; Petroleum; Post Office.)

Records.—The following international records at the end of 1946 were recognized as official by the Fédération Aeronautique Internationale:

Class C-Aeroplanes

Distance in close	d circuit (v	vithout 1	pay load):	
Record Holder	Countr	·y	Date	Record Miles
Fujita-Takahashi	i Japar	i Ma	ay 13-15, 19	38 7,239.588
Tondi, Dagasso and Vignoli	Italy	Jı	ıly 30-Aug.	8,037.899
and Vignoli			1939	
Distance in a stra	aight line:			
Record Holder	Country	Dat	e Plac	e Record Miles
Gromov, You-	U.S.S.R.	Tuly 12-	14, Moscow	to 6,305.662
machév and Danilin		193		into,
Kellett, Gething	Great	Nov.	5-7, Ismalia,	7,158.440
and Gaine, (i	Britain	193	8 Égypt,	
flight)_			Darwin	,
Combe, Burnett			Austr.	
and Gray.				
(second plane) Irvine, Stanley,	U.S.	Nov. ro	-20, Guam,l	M T
and crew,	0.5.	194		
U.S.A.A.F.		194.	ton, D	
Davies, Rankin,	U.3.	Sept. 2		
Reid, Tabel-			1946 to Col	um-
ing, U.S.N.			bus, C	0. 11,235.605
Maximum speed	over a 3	kilometr	e course:	
Record Holder	Country			Speed-m.p.h.
Wurster	Germany	No	ov. 11, 1937	379.626
Dieterle	Germany	Ma	rch 30, 1939	463.917
Wendel	Germany		ril 26, 1939	469.220
Wilson	Great Brit		v. 7, 1945	606.255
Donaldson	Great Brit	ain Sej	ot. 7, 1946	615.778
Altitude:				
Record Holder	Country		Date	Record-Feet
Pezzi	Italy	Ma	ıy 8, 1937	51,361
Adam	Great Brit	ain Ju	ne 30, 1937	53,937
Pezzi	Italy	Оc	t. 22, 1938	56,046
	Н	elicopte	rs	
Duration-closed		F		
Record Holder	Country	Dat	:e	Time
Rohlfs				20 min., 49 sec.
Sikorsky	U.S.	May 6,	1941 1 hr.,	32 min., 49 sec.
Speed over a 20	kilometre	course i	n a closed c	ircuit:
Record Holder	Count	ry	Date :	Speed-m.p.h.
Rohlfs	Germa	ny J	une 26, 1937	76.151
Wilson, U.S.A.A.I	F. U.S.	Ĵ	une 3, 1946	110.849
Distance-straight	line:			
Record Holder		Countr	y Date	Record Miles
Rohlfs		German	*	1937 10.190
Bode		German	iy June 26,	1938 143.069
Caschman, Zins,	U.S.A.A.F.	U.S.	May 22,	1946 705.3

Aviation, Military

An outstanding feature of the momentous decade (1937–46) that contained history's most devastating and only truly world-wide war was the clear-cut demonstration of the new and decisive part played by air power in relation to the other armed services. In the main there were two theories as to the proper use of air power. Some, following the classic pattern of Karl von Clausewitz, said its role should be merely one of co-operation with land and surface forces. Others, following the Italian General Guilio Douhet, the U.S. General "Billy" Mitchell and Great Britain's Lord Trenchard, claimed that air power alone was sufficient to achieve victory and should be used independently of other forces. As we-shall see as we trace

(G. M. M.)

world military aviation through, the decade 1937–46, there were elements of truth in each theory. For complete victory air power was used as a strategic weapon by striking the enemy directly through the air without the aid of surface arms: as a tactical weapon in close co-operation with ground and sea forces; and somewhat unexpectedly as a logistic weapon, a modern method of rapidly transporting men and munitions to the fighting fronts, salvaging many a critical situation.

It will be convenient to divide the decade into four parts. (1) Jan. 1937 to Aug. 1939, the prewar period, Europe; early stages, the air war in China. (2) Sept. 1939 to Dec. 1941, the air war in Europe and the Mediterranean, early stages. (3) Jan. 1942 to May 1945, the rest of the air war in Europe, and Dec. 1941 to Aug. 1945, the air war in the Pacific and Asia. (4) Aug. 1945 to the end of 1946, postwar trends of military aviation.

World's Air Forces, 1937-38.—Germany.—By Jan. 1937 the German air force, or luftwaffe, had been officially in existence for two years, although actually in existence at least four. From the mid-1920s the Deutsche Lufthansa had operated a network of air lines which gave Germany the paramount position in civil aviation in Europe. In 1931 Hermann Goering formed the National German Air association, by means of which the nazi party obtained virtual control of German aviation. When Adolf Hitler came into power in 1933, Goering became minister for air and at once began to secretly build up the luftwaffe. He put on an enormous promotion program among the Hitler youth and raised the number of flying and glider clubs in the Deutscher Luftsportverband from 300 to 2,500 and total membership to 500,000; he reorganized them with a strong military slant and called them Landesgruppen (regional groups). In March 1935 the creation of the luftwaffe was officially announced, with Goering as commander in chief. In view of his activities of the preceding five years he was able to muster 1,000 first-line military aircraft and 20,000 officers and men. He put on impressive demonstrations for the air attachés of various countries represented in Berlin.

The military aircraft consisted at that time almost wholly of Heinkel, Junkers and Dornier twin-engine bombers, adapted from commercial transports, with speeds averaging 220 m p.h. There were also good numbers of Junkers Ju-52 tri-motored transports, and a few Ju-90 and Focke-Wulf 200B Condor four-engine transports. There were two dive bombers and ground attack planes, the Henschel 123 biplane (B.M.W. 850-h.p. air-cooled radial engine, top speed 248 m.p.h.), and the more lately developed and quite remarkable Junkers Ju-87 "stuka" (sturmkampflugzeug), powered with a Jumo 800-h.p. 12cylinder inverted V-engine; diving speed was slowed to 248 m.p.h. by "venetian blind" brakes. Two secretly developed biplane fighters were the Arado 68 (B.M.W. 132 air-cooled nine-cylinder radial of 750 h.p.; top speed, 210 m.p.h.), and Heinkel 51 (B.M.W. 116 liquid-cooled, 12cylinder inverted V-engine, 750 h.p.; top speed, 225 m.p.h.). Both were used as fighter-trainers as soon as the low-wing Messerschmitt 109 was available in quantity.

All of these types of military aircraft were sent to Franco's forces in Spain beginning in the summer of 1936—a total of some 200 combat planes and 50 Ju-52s in support. The Spanish Civil War was an experimental laboratory for the luftwaffe in which military aircraft characteristics, air tactics and air-ground co-operation were tested and invaluable combat experience was gained.

Many defects were revealed and corrected, and as much as any single factor this experience accounted for the initial success of the luftwaffe in World War II.

At the beginning of 1937 the German air force had about 2,500 first-line combat planes. These included 400 medium bombers, with 700 in reserve, consisting of the Heinkel 111K, Junkers Ju-86K and Ju-88, Dornier 23 and 17S, the latter nicknamed the "flying pencil." (The letter "K" was used in the designation of bombers converted from corresponding commercial transports, and stood for krieg, or "blow"). Light bombers, including the Henschel 123 and Ju-87, numbered about 300 with 400 in reserve. There were also about 300 fighters, with 400 in reserve, including the He-51 and early versions of the Me-109, one of the outstanding fighters of the entire war. The big drive to make the luftwaffe the world's biggest and best air force was not yet reflected in first-line strength, though it was big enough to serve as political propaganda.

At this stage the luftwaffe organization was efficient and riding high politically. The German air staff in Berlin had Goering at the top, with hard-working Erhard Mılch as his deputy. Jeschonnek was chief of staff, and the likeable, clever Ernst Udet chief of aircraft design and supply. These men who built the luftwaffe were greatly influenced by Douhet, the R.A.F. leaders and Mitchell. Hitler and Goering wanted an independent air force that would win the war speedily and without disrupting the economic life of the conquered countries. The German army general staff, however, was determined that the luftwaffe should be used as an auxiliary force only, a spearhead for lightning blows (blitzkrieg) by the ground forces, particularly the panzer units, a view which finally prevailed. In any case the top echelon of the German air force missed the strategic air power boat by failing to appreciate the main air power weapon—the heavy bomber. Goering, Milch and even Udet were all against heavy bombers as too slow and vulnerable, although Udet as director of research and development was mainly responsible for the choice of German aircraft types. They wanted the luftwaffe to be fast, to rely on their fighters and on the speed of their light and medium bombers. This failure to grasp the import of the air power weapon lost them the battle of Britain, and the war.

The German air force, however, in the 1937–38 period, largely because of its dress rehearsal in the air war in Spain (ended March 1939), was much better trained, organized and equipped to fight a modern war than were contemporary European air forces, and this fact was a trump card in the scheming hands of Hitler, Goering and Joachim von Ribbentrop. First-line strength expanded from 1,000 aircraft in 1935 to some 4,000 in the summer of 1939. They wanted another year to ensure a quick, overwhelming victory, but events turned out otherwise.

U.S.S.R.—The strength and quality of the air forces of the soviet union during the mid-1930s was one of the big question marks in world military aviation. Opinion abroad tended to accept the view that the Red air force was not of much account. This view was strengthened when Charles Lindbergh in 1935, after a somewhat exhaustive tour of the German aircraft industry, followed by a visit*to Russia, greatly deprecated what he had seen of military aviation in the soviet union. Exceptions to this view were found in the reports of the French air attaché at Moscow, in the statement of Col. Hilmer von Buelow in a German military intelligence publication, and a bit later in the account of the British military analyst,



Capt. B. H. Liddell Hart in his book Europe in Arms (1937). The facts tended to confirm this minority opinion. Russian military aircraft and pilots did surprisingly well in the Spanish Civil War. Best known of all were the I-15B biplane fighter called the Chato, meaning "flat-nosed" in Spanish, and the I-16 bee-shaped low-winged monoplane known as the Rata, or Mosca (Spanish for "fly"). Best-known Russian bomber which saw service in Spain was the ZKB-26, called Katuska. These three aeroplanes were as effective as any others in the world, at that time, more so than the early German types sent to Spain.

At the beginning of 1937 it was thus more than probable that the Russian air force was the greatest on the continent, although not generally recognized as such at the time. First-line strength was estimated at 3,400-3,500 machines. It was at this time that the flying society known as the Aviakhim (formed in 1925) was merged with the O.S O. (Society for Assistance to Defense) and greatly expanded as the famous Osoaviakhim. Russian youth was enthusiastically air-minded; the elements of aeronautics were taught in the schools; gliding and parachute jumping were universal sports. In Dec. 1936 a 150,000 pilot-training program was started, completed 15 to 18 months later. Prior to this program there were between 15,000 and 20,000 pilots. The ground crew and service facilities in Spain were superior to those of the Germans. There were 11 aircraft plants, some of which produced new planes, others repaired and serviced existing planes, including trainers. At this time there were three principal engines being produced, all under licence from foreign governments. These included the M-25 (based on Wright Cyclone), the M-88 (from the French Gnome-Rhone) and the M-105 (French Hispano-Suiza). The Central Aero Hydrodynamics institute at Moscow was the seat of Russian research and development in military aviation.

The soviet air leaders showed a clear grasp of air strategy and tactics, especially as applied to combined operations with other forces, but laid less emphasis on strategic air warfare against key industrial targets of an enemy nation as developed by the R.A.F. bomber command and U.S. army air corps. The Russians were first to make tactically significant such developments as the parachute army, troop-carrying gliders and airborne infantry, as well as "storm" aviation—the use of heavily armed and armoured low-flying attack planes against enemy troops and ground objectives.

Organizationally, there were two army air forces, one in western Russia, with some 1,800 first-line planes in 1937, and one in eastern Siberia, with possibly 1,300 planes. The naval air forces consisted of shore-based aircraft, seaplanes and flying boats, totalling a probable 300 of all types. The soviet air forces of the west were, as a whole, commanded by a chief of the air force, who acted as air adviser to the chief of the general staff of the Red army. There was also an independent striking force, but this was not very active before 1942.

France.—The French Armée de l'Air, largest air force in the world during the early 1930s, had very definitely dropped behind the parade by Jan. 1937. Numbers were still there, but of the 3,600 combat aircraft on hand (1,200 to 1,500 first-line machines), more than 50% of the planes and engines were obsolescent or obsolete. Having failed to establish a sharp line of demarkation between first-line aircraft, obsolescent and obsolete equipment, the results of the not inconsiderable French aeronautical research and experimental efforts, mainly at Chalais-Meudon, could

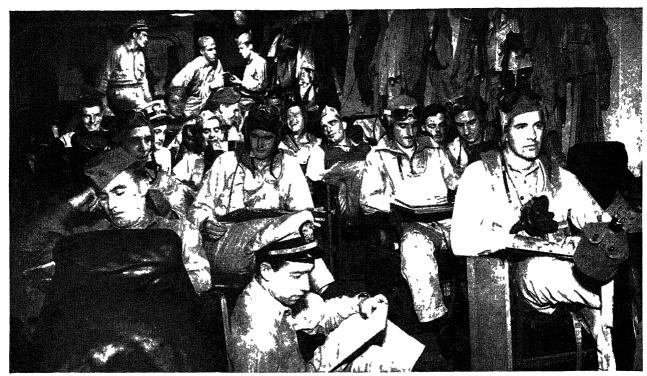
not be translated into production of new equipment until the older stuff was written off the books. The famous aircraft firms of Dewoitine, Potez, Morane-Saulnier, Bloch, Nieuport and Amiot had a promising batch of experimental monoplane fighters and a new series of high-speed bombers in prototype stage, but most of them never got into production. The French air establishment contained about 4,000 pilots and 50,000 ground personnel. The 1937 training program called for an additional 1,000 pilots and 9,000 personnel.

Things went from bad to worse in 1938. The technicians were losing their interest under the nationalization scheme started in 1936. Products of the French plants were neither as numerous nor as efficient as those coming off the assembly lines in other countries. The training program also lagged. More than half of the machines in the French air forces were not fit for active service against a first-class power. This applied particularly to the French engines of that period. Technical observers from the United States making aeronautical surveys of Europe (including Great Britain) in 1938 ranked France last in both numbers and quality of aircraft. The best fighter was the Morane-Saulnier 406, powered by a 12-cyl. Hispano-Suiza liquid-cooled engine of 860 h.p. and having a top speed of 300-310 m.p.h. A fair performer was the Potez 63 fighter, attack bomber and reconnaissance plane, powered by two Hispano-Suiza 14-cyl. air-cooled radial engines of 670 h.p.; top speed, 285 m.p.h. A 310-m.p.h. medium bomber was the Amiot 350, powered by two Hispano 12s, and the Bloch 131 with two Gnome-Rhone 14cyl. radials of 880 h.p., top speed 250 m.p.h. Armament of these planes consisted of Hispano-Suiza 20-mm. and 23mm. cannon. To augment this force in the winter of 1938-39 orders were given the U.S. aircraft industry for Pratt & Whitney and Wright radial air-cooled engines, Curtiss 75-A Hawk fighters, Martin 167 medium bombers and Douglas DB-7 light bombers.

Italy.—The remarkable rise and sharp decline of the Italian air force was one of the notable phenomena of the decade 1937-46. At the beginning of 1937 the Regia Aeronautica or Royal Italian air force was rightly reckoned among the world's greatest. There were available for immediate service some 3,400 combat planes, with about 3,600 pilots and 43,000 ground personnel. The training program had set a goal of 6,000 pilots and 60,000 personnel, and this was being carried out with considerable enthusiasm. Italy had a natural bent for air power, with its traditions of Leonardo da Vinci, one of the world's greatest inventors; Gen. Douhet, who after World War I insisted that air power should have complete authority in its own realm; and Guidoni, the genius in aeronautical research and design. One of Il Duce's first moves was the founding of Guidonia, a city near Rome completely devoted to aeronautical research and experiment for which no expense was spared in providing the latest scientific equipment, following the lead of the Germans at Adlershof (near Berlin). However, there was a fatal weakness. The above factors, true in themselves, tended to obscure the fact that Italy had the lowest war potential of any country in Europe. She lacked the raw materials vital to modern warfare, and her heavy industry and industrial equipment generally was weak. Thus many of the Italian aircraft were made of fabric-covered plywood and steel tubing.

The Regia Aeronautica learned some lessons in the Ethiopian campaign which resulted in technical improve-





U.S. navy fighter pilots in the ready room of an aircraft carrier somewhere in the Pacific during 1945

ments of their fighters and bombers. When civil war broke out in Spain, Italy, convinced that Russia's activities on the side of the loyalists threatened to become a menace to all Europe, heavily supported Franco. Large numbers of Fiat CR-32 biplane fighters (550 h.p. engine, top speed 240 m.p.h.) and obsolescent Savoia-Marchetti and Caproni bombers were sent in first, to be followed by some of the newer matériel as it came along. This included the Fiat CR-42 (still a biplane); Fiat BR-20 medium bomber; Breda 82 light bomber; Breda 88 fast, medium bomber; Savoia-Marchetti SM 79-B tri-motored bomber; and the Macchi C-200 monoplane fighter, good for about 315 m.p.h. Altogether Italy sent an estimated 2,000 military planes to Franco. Apart from this considerable numerical help, which certainly was a factor in his final victory, it cannot be said that the Italian planes or pilots made a particularly impressive showing against the Russian, United States, English and French airmen who in one way or another and in whatever equipment happened to be available, fought against them.

In the matter of aircraft engines, the Italian Fiat and Piaggio air-cooled radials of 7, 9 and 14 cylinders were roughly equivalent to similar types made in England, France and Germany. Italian V-type liquid-cooled engines were about equal to the French Hispano-Suiza, but not up to the German Daimler-Benz DB-600, Junkers Jumo-211 (both inverted V's), or the British Rolls-Royce Merlin.

Great Britain.—Under the stimulus of storm warnings of disaster ahead, the British government had made plans in 1936 for an air force second to none. Germany and Italy had made no secret of their belief that air power would be the determining factor in establishing a new balance of military power and international influence. Great Britain made her plans accordingly, in terms of the whole empire. India, the dominions and every possession were called upon to contribute to the air strength which was believed vital under the international conditions then existing. The air ministry announced that the expenditures for fiscal 1937 would be more than double those for

1936. The program included increase in bomber squadrons for long-range operations, combat squadrons for the fleet air arm, expansion of home defense with fast fighter squadrons, building up of reserve supplies including gasoline, development of aircraft and engine manufacturing facilities on a mass production basis, and increase of trained air force personnel throughout the empire. For various reasons, however, this ambitious program was far from realized within the first year or, two, parts of it not becoming effective until 1939. The main reason was undoubtedly interservice rivalry and the traditional top-side conviction of the superiority of the royal navy and the redoubtable army. Regardless of what the rest of the world did, England would march and sail to war and only defend itself in the air.

In Jan. 1937 the royal air force had a total of 4,000 planes, though probably fewer than 1,000 of these were first-line planes fit for modern air combat. The home defense forces had 1,400 planes in service, with 1,000 in reserve. The fleet air arm had about 500, including reserves. Royal air force units outside the United Kingdom had some 600 combat planes, including reserves. The air forces in India and the dominions had a total of 500 planes, including reserves. Total air force personnel in the British empire was 52,000, with 4,000 qualified pilots.

English aircraft engines were at this time among the best in the world. The famous Bristol company had the Mercury and Pegasus 9-cylinder poppet-valve engines of 650-700 h.p., and three of their specialized sleeve-valve engines, the 9-cylinder Perseus (850 h.p.) and the 14-cylinder two-row Taurus (950 h.p.) and Hercules (1,100 h.p.), all air-cooled radials. Rolls-Royce was turning out liquid-cooled V-engines, including the Kestrel (650 h.p.), with the world-famous Merlin (then rated at 900 h.p.) coming into production as the power plant of the recently-designed Hurricane and Spitfire. The Merlin was the standardized development of the specially souped-up

Bristol also had a fast new medium bomber, the Blenim, slated to replace the Fairey Battle. Handley-Page had twin-engine Hereford and Hampden, and Vickers the ellesley and Wellington, both of geodetic construction isket weave of metal strips and fabric). Another imrtant model coming into the picture at this time was e four-engine flying boat Short Sunderland. In 1934 the ministry had decided to abandon the biplane fighter favour of a heavily armed monoplane fighter. R. J. tchell of Supermarine, designer of the Schneider cup aners, came up with the famous Spitfire Interceptor, t-flown in 1936, in production in 1938 and in squadron vice in 1940. Sydney Camm, chief designer of Hawker craft, designed the Hurricane fighter, which came into vice in 1938, became the backbone of R.A.F. activities France in the spring of 1940 and largely saved the day the battle of Britain.

In the expansion of the royal air force, which followed revelation of what the luftwaffe had been doing, three hnical decisions of far-reaching importance were made: unprecedented eight Browning .303 machine guns were used in the wings of the Hurricane and Spitfire, enling them to pour a terrific fire into their opponents; a power-driven gun turret was planned for all British ig-range bombers and adapted for some current models; British production was reinforced by the purchase of eral types of U.S. aircraft and engines.

Unlike the air forces of France, the U.S.S.R. and the lited States, the royal air force after 1919 (when the royal ng corps and the royal naval air service were united) had an arm totally distinct from the army and the navy l independent of either. It was made up of men who re not soldiers and not sailors but airmen. In 1937, wever, as a result of high pressure from the admirals, fleet air arm of the royal navy was created and put der the admiralty. This consisted of aircraft flown from riers, used in naval reconnaissance and fleet operations. late as 1939 its aircraft models were largely obsolete ample, the Fairey Swordfish biplane, speed 154 m.p.h.), leficiency partly corrected early in World War II by the lition of U.S. navy models such as the Grumman Mart-(Wildcat, F4F).

Inited States.—By Jan. 1, 1937, only a bare beginning I been made in the matter of U.S. air power. The ny air corps had on hand about 1,500 military aircraft all types, of which more than 500 were obsolete and 700 re obsolescent. An additional 1,000 aircraft were on ler to meet the goal of the Baker board report (1934) "2,320 modern, serviceable planes, to be attained not er than June 30, 1940." Top strategic thinking (except ong army airmen) was that owing to the favourable ographic position of the United States, the navy was t line of defense and aeroplanes were only useful for operation with ground and sea forces and for defense uinst actual air attack. This prevailing point of view ided to clip the wings of U.S. army aviation. The air ps on June 30, 1937, consisted of about 1,300 officers and 000 enlisted men. On this same date the navy's air force 1 927 service and 195 obsolescent aircraft on hand and) new aircraft on order. A five year goal was to bring : authorized total to 1,910 planes in 1942. Besides the ler aircraft carriers, "Saratoga" and the "Lexington," : "Ranger" had been commissioned in 1934, and the ger sister carriers "Yorktown" and "Lexington" in 1936. A good foundation for air power had been laid with establishment on March 1, 1935 (based on appoint-

ments in Dec. 1934), of the general headquarters air force, commanded by Maj. Gen. Frank M. Andrews. The G.H.Q. air force comprised all combat units of the air corps, with general headquarters at Langley Field, Va., and three wings with bases on the Atlantic and Pacific coasts and the south-central part of the United States. It was here that U.S. air doctrines, following closely some of the dynamic ideas of both Gen. Mitchell and the Italian Gen. Douhet, crystallized, and new applications were developed. Andrews, Hugh J. Knerr, Henry H. Arnold, Carl Spaatz, George Kenney, Harold L. George and a few others contended that the long-range heavy bomber was the keystone of air power. To destroy vital industrial targets back of the enemy front lines or to attack a hostile fleet hundreds of miles out to sea meant that bombers had to have not only range, but speed, defensive armament, precision navigational instruments and bombsights and a bomber crew which could work together as a team. This philosophy was embodied in the development of the four-engine Boeing B-17 Flying Fortress, long-range daylight bomber, a type which was to be proved as the air power weapon par excellence of World War II.

Other ideas of these airmen included the conception of attack aviation, close co-operation with ground forces as an air-ground team, not simply support of ground forces, such as artillery support. Also the thought that air power should be as nearly as possible self-sustaining by means of a fully developed air transport service to bring engines, propellers, parts and supplies to forward bases as rapidly as possible.

The 1937 crop of air corps planes consisted of stubby Seversky P-35 and Curtiss P-36 fighters, with a few dozen obsolete Boeing P-26s still around; the standard medium bomber was the Martin B-10 and B-12, with the Douglas B-18 (developed from the DC-2 airliner) coming in; the first of the Boeing B-17s, the world's only four-engine daylight bomber, was accepted; attack planes included the Northrop single-engine A-17 and the Curtiss twin-engine A-18. Navy fighters included the Grumman F3F and Curtiss F2C (biplanes); scout bombers, Vought SBU-2 and Curtiss SBC-3 (biplanes) and Vought SB2U low-wing monoplane; Douglas TBD Devastator was a torpedo bomber and Consolidated PBY a patrol bomber; main scout observation type (with floats, catapulted from battleships and cruisers) was the Vought OS2U Kingfisher. Practically all army and navy models were powered by air-cooled radial engines by Wright and Pratt & Whitney, ranging from 750 to 1,000 h.p. The Allison liquid-cooled engine was under development.

On June 30, 1938, air corps strength stood at about 19,200, with 1,300 officers. About 500 military pilots per year were being turned out at Randolph and Kelly fields, Texas, and about 1,000 aeroplane and engine mechanics at Chanute field, Ill. In Sept. 1938, the month when Hitler held up Europe at the Munich conference with his threat of air power, Brig. Gen. H. H. Arnold became chief of the U.S. air corps. In view of the storm clouds over Europe in April 1939, an air corps expansion bill was passed in congress, authorizing the purchase of 6,000 aeroplanes, increase of officers to 3,200, enlisted men to 45,000, and a pilot training program with a peak of 20,000 per year, to be reached in stages, with a goal of 24 combat groups. Also, funds were appropriated for constructing large air bases in the four quarters of the country, dividing the U.S. into four air districts. In Aug. 1939, 30th anniversary of the acceptance of the first army aeroplane, the

air corps had a series of demonstrations resulting in the capture of several international records for speed, altitude and payload of heavy bombardment aircraft, using B-17s and the huge Boeing B-15 (only one built).

U.S. naval aviation stepped up its activities during 1938 and 1939, developing new types of fighters and scout-bombers (including the famous Grumman F4F Wildcat and Douglas SBD Dauntless, which were to prove the backbone of the early months of the Pacific war), and increasing the training program of pilots and technicians. Aircraft carriers took an increasingly prominent part in fleet manoeuvres.

China.-When Japan began the "Chinese incident" in July 1937, China's air force consisted of about 600 obsolescent aircraft. Generalissimo Chiang Kai-shek almost from the start had a high appreciation of air power, and he made Madame Chiang secretary general of the Chinese air force. In 1932 China's financial expert in Washington, D.C., Dr T. V. Soong, engaged Col John J Jouett, disciple of Gen Mitchell and West Point classmate of Gen. Spaatz, to build up a modern air force for China. With a small group of U.S. fliers and hearty co-operation from the generalissimo and a dynamic little Chinese air officer who had learned to fly in Russia, Maj. Gen. Peter T. Mow, Jouett drastically overhauled the Chinese air force. He established a new Central Aviation school at Hangchow, and by 1933 the school had 250 modern combat planes and 350 Chinese pilots trained to the exacting standards of the U.S. army air corps. The Japanese brought such heavy pressure to bear that by the end of 1934 the Jouett mission was terminated, but not before it had seen the establishment of indigenous aircraft factories for turning out planes, though no engines.

From 1935 the Chinese were forced to buy up a conglomeration of whatever foreign planes they could, including Italian Bredas, Fiats, Savoia-Marchettis, German Heinkels and Junkers, British Bristol Bulldogs and Armstrong-Whitworths and American Boeings, Martins, Northrops and Vultees. Curtiss Wright's export company for the far east, Intercontinent corporation, had set up an aeroplane factory in China. This corporation was acquired by William D. Pawley, who sent Charles Day to China to manage the factory. When the Japanese struck in 1937, Madame Chiang asked Day to remain and help the national government in aircraft production. His first job was to move the Pawley factory into the interior of China, and during the next four years it was moved eight different times to avoid being blasted by the Japanese bombers.

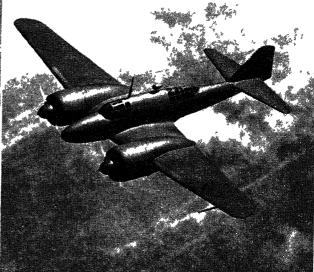
In 1937 the Chinese made another effort to revive their air power with US help. A US. air corps captain, Claire Chennault, an expert in aerial tactics, had retired on account of deafness. Two of his associates who had been in China helping to train combat pilots recommended Chennault to the generalissimo, who promptly brought him to China. However, it was too late to whip up the semblance of an air force before the Japanese attacked, and within a few weeks China's air force was nearly obliterated. For the next three years, except for a few courageous counterattacks by Chinese pilots with locally built Curtiss Hawks, a couple of Martin 139 (American B-10) bombers and a few Russian Chato, Rata (Mosca) fighters, and SB bombers, the air war in eastern Asia became a gigantic slaughter of Chinese civilians by the bombs and machine guns of the Japanese air force. All this time, however, Chennault was observing, studying and planning for the day when China would strike back.

Japan.-Like the air forces of the United States, France and several other countries the Japanese army and navy each had its own aviation. In 1937 the Japanese imperial army air corps had about 940 combat planes, while the Japanese navy had about 480 combat planes with the fleet and 580 at shore stations. This represented a grand total in both services of about 2,000 combat planes, many of them obsolete. Less than one-third of these were bombers, a deficiency made up later. The 2,300 pilots and 22,000 ground personnel were about evenly divided between the army and the navy. The headquarters air force of the army aviation service was closely patterned after the U.S. army G.H.Q. air force. It was the striking force of army aviation, and was charged with the defense of Japan's coasts and its outposts in Manchuria. One brigade (similar to wing) was based at Gifu, a second at Kwainei, Korea, and a third in Formosa. The navy was making every effort to increase the number of carriers, and in July 1936 laid the keel for the new aircraft carrier "Hiryu," of 10,500 tons. By 1938 army air squadrons were to be increased from 32 to 38, and navy's 40 to 52. The immediate concern was home defense, and the fear that in any largescale campaign the chief industrial and political centres of Japan might be subjected to destructive air raids. The imperial army air corps also had to be built up for the campaign in China which, it was thought, might prove long enough to deplete the air forces and make Japan vulnerable to attack by Russia. Naval aviation needed to be strengthened to maintain communications and support Japan's far-flung lines of conquest.

The year 1936 saw a six-year army reform plan instituted, with the militarists more firmly in the saddle than ever. Pilot-training was stepped up, and aircraft production increased. From the outset Japan had resorted to the copying of certain models of foreign planes and engines or building them under licence, in some cases making ingenious improvements. However, the great weakness was a lack of the raw materials and processed materials required to reproduce United States, German or Italian planes. This meant danger of structural failure of their planes in combat, an eventuality which came to pass with great frequency in the Asiatic-Pacific war which lay ahead. From early 1937, as a result of a treaty with Germany, production of planes and engines from Japan's own aircraft factories was slightly augmented by shipments from its axis partner in the west.

Air War in Europe, Early Stages.—Germany.—During 1938 the German air force had been organized territorially into three air fleets, or Luftflotten. Headquarters of No. 1 was at Berlin, under Albert Kesselring; No. 2 was at Brunswick, with Felmy commanding; No. 3 was at Munich, under Hugo Sperrle. After the political conquests of that year, fleet No. 4 was organized with H.Q. at Vienna, commanded by the Austrian General Alexander Loehr. At the start of the Polish campaign in Sept. 1939, the luftwaffe had a first-line strength of some 5,000 aircraft. Air fleet No. 1 with advanced H.Q. in East Prussia and No. 4 with advanced H.Q. in Breslau were used in Poland. The bomber force had about 700 aircraft, including He-111K, Do-17S and a few Ju-26K, the latter not used as a bomber again. The newer, faster Ju-88s were not used in Poland. There were about 400 fighters, mostly Me-109E (improved over the original version by use of the Daimler-Benz 1,150-h.p. engine), some twin-engine Me-110s and a few biplane He-51s, henceforth used only as a fightertrainer. There were 150 Ju-87 stukas, 350 reconnaissance planes and 250 Ju-52 transports. Altogether between 1,800 and 1,900 aircraft, against a Polish air force of some 500





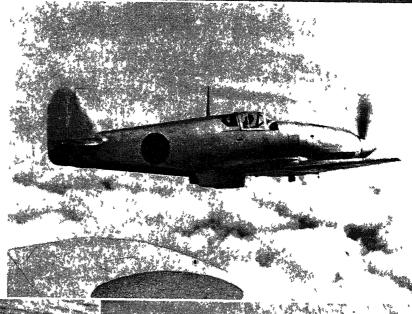
Above: Mitsubishi Zeke 52 (Zero), Japanese carrier fighter plane: maximum speed 354 m.p.h.; cruising speed for maximum range 152 m.p.h.

Above, right: Dinah 3, Japanese light bomber and reconnaissance plane with a maximum speed of 407 m.p.h.

Right: Tony, Japanese fighter plane with a top speed of 361 m.p.h.

Below, left: Sally 2, Japanese medium bomber capable of 294 m.p.h.

Below, right: Rufe II, Japanese float plane used for fighting and observation; maximum speed 345 m.p.h.







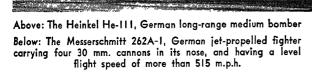


The Messerschmitt Me-109, German fighter plane with top speed in excess of 350 m.p.h.



The Messerschmitt Me-163, speedy rocket interceptor of the German air forces, with a top speed of 550 m.p.h. and a cruising speed of 250 m.p.h.







Above: Captured Junkers Ju-88, German medium bomber (with U.S. marking on tail and wings)

Below: The Focke-Wulf 190, German fighter plane with a top speed in excess of 380 m.p.h.





Following the Douhet pattern, the luftwaffe operations were in three phases: (1) destroy the Polish air force on the ground; (2) destroy in air battles any units of the P.A.F. able to engage in combat; (3) destroy the Polish ground forces means of deployment, such as rail lines, bridges, supply and ammunition dumps, communications, etc. Also (not à la Douhet) provide air co-operation for the wehrmacht wherever needed. Despite the lightning victory which practically eliminated the Polish air force in two weeks, the luftwaffe lost some 600 planes in combat with the courageous Polish fliers, besides an additional 1,500 to 1,800 through forced landings, crack-ups in taking off and discarding of planes which could not be serviced during the campaign. This was the result of a direct policy set by Milch, overruling Udet, a costly mistake which was to plague the luftwaffe more and more as the projected lightning victory failed to materialize.

After Poland the luftwaffe regrouped for the Danish-Norwegian campaign which began April 9, 1940, when Hitler invaded the two Scandinavian nations. This campaign was a victory for the lultwaffe as a means of an transport rather than as a strategic or tactical unit in air combat, with the old Ju-52 transport the most effective plane in ferrying clouds of German troops over the helpless head of the British navy. In all, some 800 planes were used, of which half were long range bombers, including the new and effective Ju-88. There were at least 100 to 150 floatplanes and flying boats, including He-115, Dornier and Blohm & Voss models. Especially effective were the converted Focke-Wulf 200 Condor four-engine transports used for armed reconnaissance and antishipping patrol with a 1,000-mile radius of action and endurance of 12 to 15 hours. This planned use of air transport and antishipping operations was an example of the adaptability of the luftwaffe squadrons and the value of the special training given during the winter of 1939-40. The important strategic lesson of the Norwegian campaign was that land-based aircraft could prevent superior sea power from exerting itself if naval units ventured to operate within convenient bomber range.

The role of the German air force in the campaign against the Low Countries and France was that of cooperation with the wehrmacht, with all air actions within the framework of the main ground strategy, as in Poland. On May 10, 1940, German armies crossed the Belgian and Dutch borders, and the luftwaffe launched an immediate and highly successful air offensive against the airfields of the Netherlands. In most cases the Dutch planes were never able to get off the ground. The German armies broke through, heavily supported by dive bombers, the luftwaffe even providing air protection for the rapidly advancing tank columns. Some 3,500 to 3,800 combat aircraft, or nearly four-fifths of the total front-line strength of the German air force was thrown into the campaign. The cream of luftwaffe fighter and dive-bomber pilots was available at that time. Aircraft types included 1,400 long range bombers (Ju-88, He-111K, Do-17S); 400 dive bombers (all Ju-87s); 1,200 fighters (900 Me-109s, 300 Me-110s); 600 reconnaissance aircraft (Do-17 and He-111 for long range strategic reconnaissance, Henschel 126 for tactical and the agile Fieseler Storch as a liaison plane for communications, etc.); some 500 Ju-528 provided the German squadrons with tactical mobility. Despite heroic resistance by advance R.A.F. units, aided to some extent by French pilots, the luftwaffe had things more or less its own way. The last wings flew back to England on June 15, 1940, the day after the nazis marched into Paris.

Up to that time the luftwaffe had had no occasion to meet a first class air force in air combat and to try out Douhet's classic second principle: destroy in the air the enemy planes which had not been destroyed on the ground. During the Dunkirk evacuation (May 27-June 4, 1940) the German air force had its chance, but to the dismay of its leaders and its pilots, received the mauling of its life. On May 29 R.A.F. fighter group 11 left its bases in England to engage the luftwaffe before it could break through to Dunkirk and create a genuine catastrophe. Hurricanes, Spitfires and Boulton-Paul Defiants pitched into a much larger German force of some 1,500 aircraft, mostly Ju-87s and Me-109s, and destroyed at least 300 as against 100 R.A.F. losses. They had the edge in speed, manoeuvrability, fire power and pilot training. It was a decisive defeat.

In Germany, however, the luftwaffe was riding high because of its spectacular successes with the German army in the Netherlands, Belgium and France. After this sustained sprint a breather was needed, and this lack of staying power was the luftwaffe's most glaring deficiency; inability to attack England shortly after Dunkirk probably lost the war for Hitler. The British were given time to organize their air defense, including their chain of radio-location (radar) stations. During the battle of Britain these stations enabled fighter controllers to detect the direction, strength and height of German air attacks, permitting the R.A.F. to use their Hurricanes and Spitfires very economically, and cut fighter patrols to a minimum. According to German communiqués the all-out air attack on England started Aug. 10, with the entire luftwaffe of 3,500 first-line aircraft, with 50% to 75% reserves available.

The first phase lasted from Aug. 10 to 18, and consisted of great numbers of Ju-87s with fighter escort (a lesson learned at Dunkirk) bombing convoys, shipping, ports, coastal airfields and installations, while the longer range Do-17s, He-111s and Ju-88s attacked fighter aircraft factories and radio-location stations. However, the R.A.F. pilots knocked down 697 German planes against 153 losses, and the German objectives were not realized. Goering pushed on to the second phase, which ended Sept. 5, and aimed at destroying inland airfields, factories, railroads, communication systems, etc. Despite heavier fighter escort German losses were 562, British 219 (with 132 pilots parachuting to safety). Again, the objectives were not realized, but in desperation Goering threw everything into the third phase, a relentless bombing of London, which lasted until Oct. 5. In 38 daylight and 8 night attacks the luftwaffe lost 440 planes, the R.A.F. 58. During the rest of October the final phase took place, featured by small formations of Me-109s and Me-110s dropping small loads of bombs in hit-and-run raids at night. The luftwaffe had lost. At least 2,375 planes down in combat, half as many again in operational losses, and thousands of well-trained pilots and other crew members lost. Reasons for the failure were many. Chief among them was the lack of true understanding of air strategy, which called for a concentrated attack on English fighter airfields, using fragmentation bombs and ignoring all other targets. On the technical side, the terrific fire power of the eight-gunned Hurricane was more than a match for the fast but lightly armed German bombers, and the similarly armed, speedy Spitfire outfought the German fighters.

The scene then shifted to the Mediterranean. Toward

26!

the end of 1940 the luftwaffe set up an air headquarters in Rome and an operational command in Sicily. The main local objective was to aid the Italian air force in neutralizing Malta as a base for shipping passing through the Mediterranean. This would compel the British to reroute their convoys to the near east via the much longer route around Africa.

Except for April and May 1941 the luftwaffe in the Mediterranean was never very formidable. It consisted of the 10th air corps, drawn from Norway and western Europe, and included some 350 combat aircraft-150 Ju-88s and He-111s, 150 Ju-87s, 40 Me-110s and about a dozen long range reconnaissance aircraft. In the spring of 1941, 50 Me-109s were added. Despite heavy attacks Malta held out, although shipping became a costly venture. The capture of Crete in May 1941 by glider-borne forces was a remarkable operation. The German air force, operating in close support of Rommel's give-and-take battles in North Africa, varied between 200 and 300 aircrast of the current types. When Yugoslavia entered the war on the Allied side, the luftwaffe came up with a quick redistribution of forces, doubling the Balkan air force from 500 to 1,000 aircraft within a week by drawing from western Europe. However, in June, just as the British position in the middle east seemed particularly grave with Erwin Rommel at the Egyptian border, Hitler invaded the U.S.S.R.

For a combination of reasons, and despite Goering's warning, Hitler had made this decision, and the Russian campaign began on June 22, 1941. After the battle of Britain was lost, airfields in Norway, Finland, Poland and Rumania were prepared for receiving German air force units. By the end of the Balkan campaign in June the luftwaffe had some 3,000 aircraft on the eastern front, representing about two-thirds of its current first-line strength. Three of the five Luftflotten, No. 2 (from the Low Countries), No. 4 (from the Balkans) and No. 5 (from Denmark-Norway), plus the entire tactical support organization which enabled the German armies to make their lightning drives in the west, were there, together with Germany's top air force commanders, including Albert Kesselring, Alexander Loehr, Wolfram von Richthofen and Robert Ritter von Greim. The plan was for an all-out attack to destroy the Red air force on the ground, smash through and crush all Russian resistance within six months at the most. The Russians failed to co-operate.

German aircraft types included 1,000 long range bombers (He-111s, fewer Do-17s, more Ju-88s), 400 dive bombers (Ju-87s), 900 fighters (750 Me-109s, 150 Me-110s), and 700 reconnaissance planes. This total of 3,000 for an 1,800-2,000 mile front meant spreading the tactical support far too thin, and precluded anything like sustained strategic air operations against vital industrial targets behind the Russian lines. Owing to the vast Russian distances a fleet of 500 Ju-52s was constantly required to maintain operating efficiency in the forward areas.

By a sudden surprise attack, heavy losses were inflicted on the Red air force in the early days, although Russian dispersal in both width and depth prevented these losses from becoming disastrous. The inferiority of the Russian fighter aircraft at this early stage, plus the far greater combat experience of the German pilots meant that the luftwaffe gained air mastery and paved the way for the rapid progress of the German armed forces through the Baltic states, Poland, White Russia and the Ukraine. By October, however, the luftwaffe was panting for breath, and with

the failure to take Moscow and the coming of winter, Hitler called for a lull. Taking their own winter in their stride, however, the Russians counterattacked.

U.S.S.R.-Seven days before Hitler invaded Poland he entered into a secret nonaggression agreement with Russia, the Ribbentrop-Molotov pact. Moscow undoubtedly knew Hitler's ultimate intentions, but this gave a breathing spell to build up soviet defenses. As soon as the nazis had conquered Poland (Sept. 17, 1939) the soviet armies moved into Poland from the east, and within two days raced across nearly half of Poland to the Russian 1918 border, cutting off Hitler from the rich oil wells of Galicia and blocking the road to Rumania. In October Moscow made certain demands on Finland, most of which were met, but later the negotiations were broken off, and on Nov. 30, 1939, Russian planes bombed Viipuri and Helsinki. The Finns resisted stoutly and held the Russians in the north, but in January a direct assault on the Mannerheim line was made, and with a more effective use of the Red air force, a break-through was achieved in March, Finland surrendering on March 12. This did not help Russia in world opinion, but it did provide a buffer in the north which undoubtedly saved Leningrad a year or two later. Fifteen months after Finland gave up, Hitler attacked Russia.

The war between Germany and Russia was primarily a land war, with the air forces on both sides used almost wholly in support of army operations. Probably nobody outside Russia knew how many aircraft the Red air force had in June 1941, but it may well have been 3,000-4,000 in first-line aircraft, many of them obsolescent, with 50% to 75% in reserve. All aircraft, engine and accessory production was in state factories under the Glavavioprom (central directorate of aeronautical industry). Estimated production was 750 to 800 planes per month, some of the factories already located beyond the Ural mountains.

The bulk of the fighters were Spanish Civil War veterans, including the I-15 biplane, improved I-153, and the stubby I-16 and I-16B low-winged monoplane (I is for Istribuitel, or destroyer). Top speed ranged from 250 to 295 m.p.h., which was also the speed bracket of the current medium and attack bombers, the SB-2 and PE-2. During the first few months all these models suffered heavily at the hands of the new Me-109F with its top speed of 380 m.p.h. The new soviet air force fighters, I-18 (later designated MIG-3 after its designers Mikoyan and Gurievitch) and I-26 (YAK-1, for Gen. Alexander Yakovlieff, designer and vicecommissar of aviation) were in the 350-375 m.p.h. range, but only a few of them were in operation; this was also true of the famous IL-2 Stormovik heavily armed attack plane dive bomber, named from Sergei Ilyushin. The Russian air force was also weak in reconnaissance aircraft, relying on the SB and DB bombers (S for srednye, medium, and D for dalnye, long range), which were 50 m.p.h. slower than the widely used Ju-88 on the German side. The most effective part of the Russian air force was the groundattack forces even in this early stage, with their use of I-15 and I-153 and older biplanes in low-level attacks as fighter bombers and ground-strafing aircraft, including their use of small rocket bombs launched from rails against German tanks and other ground targets.

The Ju-87 stukas, shot out of the air in droves by Spitfires and Hurricanes over England, were expected to have a field day in Russia. However, after the first few weeks the determined Russian anti-aircraft gunners learned to speed their technique to catch them as point-blank shots in their fast 70 to 80 degree dives.

All in all, the wehrmacht and luftwaffe found they really

had a bear by the tail in the Red army and air force, and the dream of a quick victory froze up on the Russian steppes.

France.-In the spring of 1940 the French Armée de l'Air had about 600 first-line fighters, with 700 in reserve. Best of these was the U.S. Curtiss Hawk 75A, of which there were several hundred; top speed was 315-320 m.p.h. The reliability and long service span of the Wright Cyclone 1,000-h.p. air-cooled radial engines were in marked contrast to the Hispano-Suiza and Gnome-Rhone engines of French aircraft. French fighters included the Potez, Morane and Dewoitine models, with a speed range of 290 to 310 m.p.h. The principal German fighter of this period, the Me-109E, had a top speed of 350 m.p.h., was manoeuvrable, well-armed and more than a match for any of the French fighters, including the U.S. Hawks. The French pilots, however, fought with such skill that they managed to knock down several hundred German fighters and bombers in air combat. French bombers numbered about 300 with 100 in reserve. U.S. twin-engine Martin 167 (afterward called Maryland by the British) and Douglas DB-7 (later named Boston) were just beginning to trickle through. In any case the Germans had definite air superiority, which meant limited activity for the French bombers. When France surrendered, all military equipment, including planes, had to be yielded. However, Gen. Charles de Gaulle's historic call from London on June 18, 1940, was answered by numerous trained pilots. They became the nucleus of the Free French air forces under the command of Gen. Henri Valin, former chief of staff of the Armée de l'Air. They were combined with the French North African aviation corps in Aug. 1943. Besides this many individual French fliers fought with R.A.F. units in both fighter command and bomber command.

Great Britain.—As we have seen, the royal air force was a completely independent arm, co-equal with the British army and royal navy, rooted in the air ministry whose controlling authority was the air council. At the outbreak of World War II, Sir Archibald Sinclair was president of the air council and secretary of state for air; chief of the air staff was Air Chief Marshal Sir Charles Portal, later marshal of the royal air force (five-star rank). The home commands included bomber command, whose primary function was attacking strategic targets in the enemy country; fighter command, initially for air defense, but later used with great effect in short range offensive operations; coastal command was responsible for all oversea operation in close association with the royal navy, including air patrol, antisubmarine activities, convoy patrol, etc.; also training command, maintenance command, etc. Overseas commands included the middle east command under Air Marshal Sir Arthur W. Tedder; air forces in India; R.A.F. ferry command, with headquarters in Canada for ferrying U.S. aircraft across the Atlantic by air. Production of aircraft and engines was under the ministry of aircraft production, headed by Sir Stafford Cripps and taken over in the spring of 1940 by Lord Beaverbrook, at which time it was still below the wholly inadequate production of the summer of 1939

Bomber command was active in the war within an hour or two of its declaration, and within six months had built up an impressive record of "leaflet raids" and day and night photographic reconnaissance missions, which were not only valuable in themselves but served to train the most expert night-flying pilots and navigators in the world, an indispensable foundation for the great night air assaults against the Ruhr valley and other vital objectives which began two years later. Besides these missions there

were regular bombing missions against ports, bases of mine-laying aircraft, etc. Bombers available were the obsolescent Fairey Battles, Handley-Page Hampdens, and Armstrong Whitworth Whitleys, with the Bristol Blenheims and Vickers Wellingtons; speed range of this group was from 240 to 275 m.p.h.; bomb loads from one to two-andone-half tons. In 1941 the advent of the four-engine Short Stirling and Handley-Page Halifax, which carried eight and six tons of bombs respectively, added greatly to the weight of bomber command's attack, as more and more trained crews began to be available from the great British commonwealth air training program which had been set up in Canada. Main types of targets included aircraft factories, factories making aluminum, oil-producing plants and communications (rail junctions, bridges and canals). In six months from April to Sept. 1941, some 20,000 tons of bombs were dropped on such targets.

Bomber command also used fighter-escorted Blenheims in day attacks, especially against shipping, took an active part with coastal command in the battle of the Atlantic and carried out an extensive mine-laying program to help keep an airtight blockade against Germany. In Jan. 1941 Blenheims also began a long campaign against enemy airfields on the French coast, which later included Hurricane, Whirlwind and Typhoon fighter bombers, and U.S. built Bostons and Mitchells.

During the first year of the war coastal command flew 13,000,000 mi. in 106,000 flying hours. Some 160 attacks were made on U-boats, and air escorts were provided for more than 50,000 ships in convoy. Big Sunderland flying boats were the mainstay, plus Avro Anson bombers for patrol. During 1940 the first of the U.S. built Lockheed Hudsons went into operation, performing with noteworthy effect. Converted from the Lockheed Electra 12-passenger fast transport, and with the addition of a power turret, the Hudson surprised everybody with an amazing record of reliability and versatility.

Because the field of battle was out of range of fighters designed primarily for the defense of England, fighter command was unable to prevent the Germans from winning the battle of Norway by a shuttle service of transports across the Skagerrak. When the Germans invaded the Low Countries on May 10, 1940, the R.A.F. had six Hurricane squadrons of the air component, four with the British expeditionary force and two with the French. That same day two more joined the British and the next day one more squadron joined the French, or some ten fighter squadrons (120 Hurricanes and pilots) against the massed might of the luftwaffe. A second force, known as the advanced air striking force (A.A.S.F.), consisted of two squadrons of Hurricanes, eight of Battles (light bombers) and two of Blenheim medium bombers. The French air force worked with this A.A.S.F. Within two weeks, however, all R.A.F. aircraft except three Hurricane squadrons of the A.A.S.F. had been withdrawn to England; so rapid had been the enemy's advance that available airfields had dwindled to a handful. We have seen how with air supremacy over the channel, fighter command won over Dunkirk, whereas without it the powerful Royal navy lost in Norway. We have also seen how a quickly reorganized fighter command, aided by radio-location, some telling attacks by bomber command and constant vigilance by coastal command, turned the tide in the battle of Britain, decisively defeating the luftwaffe. This may be reckoned one of the turning points of history, when so much was owed by so many to so few.



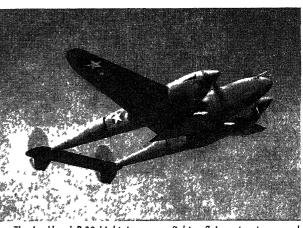
North American P-51 Mustang, army fighter plane with a maximum speed of 435 m p.h.



B-26 Martin Marauder, army medium bomber



The Douglas A-26 Invader, lightweight attack bomber of the U.S.A.A.F. with a top speed of 355 m.p.h. which went into action in 1944



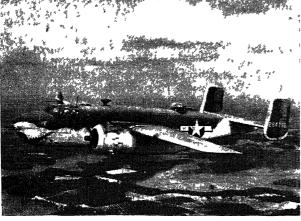
The Lockheed P-38 Lightning, army fighter flying at a top speed of 414 m.p.h. and equipped with zero-type 14 rocket launchers for carrying 5-inch rockets



Left: The Republic Thunderbolt P-47-N, single seat fighter plane of the U.S.A.A.F.

Below, left: The Mitchell B-25, hard hitting attack bomber of the U.S.A.A.F.

Below: The B-24 Liberator, heavy bomber of the U.S.A.A.F. memorable for its strategic bombing of the Ploesti oil fields of Rumania in 1944





When the Germans switched to night hit-and-run attacks, fighter command had to improvise night fighter defense. At first it was like a needle in a haystack, but as radio-location improved, and especially after a lightweight AI (aircraft intercept) radar set could be fitted in the night fighters, successes mounted. On account of their endurance Blenheims were used first, then the faster single-engine Hurricanes and Defiants, followed by twin-engine Douglas DB-7s called Havocs, and the 330-m.p.h., powerfully-armed Beaufighters. The last mass night raid was May 10, 1941, when 33 German bombers were shot down out of 250, with as many more seriously damaged.

After the collapse of France in June 1940, Italy declared war and prepared to attack Egypt from Libya. The R.A.F. had about 170 aircraft, mostly obsolete, in the middle east, against 400 modern fighters and bombers of the Italians; the R.A.F. also had about 85 more in East Africa against Italy's 110 bombers and 60 fighters. Technically outclassed and outnumbered, the western desert air units (five squadrons of Blenheims, Gladiators and Lysanders) had a threefold task, to maintain close co-operation with the land forces, to destroy and cause confusion among enemy vehicles and personnel and to maintain an offensive against enemy supply bases, airfields and sea communications. By November some 175 additional aircraft arrived, more Blenheims, Gladiators and Lysanders, two squadrons each of very welcome Hurricane fighters and long range Wellingtons for night bombing. Before the December offensive, casualties were heavy as the Italian fighter force outnumbered the R.A.F. four to one. Sir Archibald Wavell, however, advanced 400 mi. to Bengasi in 63 days against a neutralized Italian air force, some 1,100 disabled Italian planes being counted by the advancing British troops. In the spring the R.A.F. middle east was widely dispersed (Africa, Greece, Malta and Iraq), Malta was largely neutralized and Gen. Rommel was able to ferry an army across the Mediterranean. Pushing rapidly on, he by-passed Tobruk, but was stopped at the Egyptian border in June 1941.

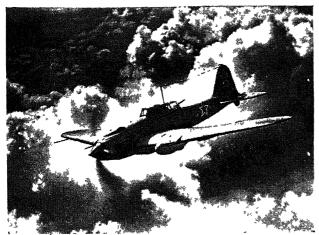
Italy.—With the imminent collapse of French resistance in June 1940, Mussolini saw the realization of his dream of building a great Italian empire in Africa and making the Mediterranean an Italian sea. After he declared war on June 10 planes of the Regia Aeronautica based in Sicily and southern Italy launched attacks against Great Britain's key base of Malta and prepared an attack against Egypt. The Italian navy, though not a match for the British, was a formidable enemy in the Mediterranean because the royal navy was widely dispersed for home defense and Atlantic life line convoy duty. On Nov. 11, 1940, however, the fleet air arm delivered a crushing blow against the Italian fleet. A mixed force of obsolete Swordfish bombers and torpedo carriers with a fighter escort of Gladiators and Fulmars took off from the "Eagle" and "Illustrious" and sank or heavily damaged three battleships, two cruisers and two auxiliary vessels.

In October Mussolini launched his attack upon Greece, and the R.A.F. sent a limited number of aircraft to help against the Italians, occupied Crete and set up an air base there. As in Africa the Italian aircraft and pilots proved no match for the British, and during February and March lost heavily in several engagements. The chief reason for the eclipse of the Italian air force was the decisive superiority of the British fighter squadrons, equipped with eightgunned 335-m.p.h. Hurricanes. The best the Italians could muster were the Fiat G.50 Falcho (falcon), top speed 290 m.p.h., and the 305-m.p.h. Macchi G.200 Saetta (lightning); both were armed with two 12.7-mm. (.50-cal.) and two 7.7-mm. (.30-cal.) machine guns, and were powered by Fiat

850-h.p. radial engines. The Reggiane Re-2000 with Fiat 1,100-h.p. engine and speed of 330 m.p.h. was coming into service in early 1941, but not in sufficient numbers to help materially. (Developments of the Italian air force subsequent to June 1941 are treated under the narrative of the luftwaffe in the Mediterranean.)

United States.—During 1940 as the emergency became more critical, the U.S. army air corps expansion program moved rapidly forward. After the Germans had swept through the Low Countries and France, spear-headed by air power, the president called for an air force of 50,000 planes and an annual production capacity of that amount. (Almost 48,000 were produced in 1942, and about 86,000 in 1943 and more than 96,000 in 1944.) By June 30, 1940, an immediate goal had been set-54 combat groups, 10,000 officers, 15,000 flying cadets, 150,000 enlisted men and 14,000 aircraft of all types. At that time there were 16 skeleton groups and wings, and about 50,000 officers and men. To train the large number of technicians requiredaircraft and engine mechanics, radio men, armourers, etc., three great technical schools were set up at Chanute field and Scott field, Ill., and Lowry field, Colo. Three flying training centres were established-Randolph field, Texas, Maxwell field, Ala., and Moffett field, Calif. A number of carefully selected civilian schools for primary flight and aeroplane engine mechanics training were brought into the picture for the new program of 7,000, then 12,000 pilots per year, and 30,000 aeroplane mechanics, plus bombardiers and navigators for heavy bomber air crews. All this training was under the commanding general of the G.H.Q. air force, which by the end of 1940 had four main district headquarters in the four corners of the land; these later became the 1st, 2nd, 3rd and 4th air forces. To provide the necessary bases for the 288 squadrons authorized by congress, the air corps began a great building program in the United States, with a similar expansion in the Canal Zone, Newfoundland, Alaska and Hawaii.

In the spring of 1941 a major reorganization of what had been the U.S. army air corps after 1926 took place. In April 1941 Robert A. Lovett was appointed assistant secretary of war for air. He, more than any other individual, was responsible for convincing the president and the secretary of war of the prime importance of the heavy bomber as a war-winning strategic weapon, and for establishing the Boeing-Douglas-Lockheed B-17 program, and the Consolidated Vultee-Ford-Douglas-North American B-24 program, which during the first seven months of 1944 was turning out between 1,250 and 1,500 big four-engine bombers per month. In June 1941 the war department announced the creation of the army air forces as a semi-autonomous unit with: (1) H.Q. army air forces; (2) the air force combat command; (3) the air corps; and (4) all other air units. The HQ. AAF in Washington included Maj. Gen. H. H. Arnold as chief of the AAF, with a separate air staff organized on the lines of the general staff, of which Brig. Gen. Carl A. Spaatz was chief. The air force combat command was the striking force, a logical outgrowth of the G.H.Q. air force, and was divided into four complete air forces covering the entire continental United States. Its chief was Lt. Gen. Delos C. Emmons, with headquarters at Bolling field, Washington. The air corps, headed by Maj. Gen. George H. Brett, was the arsenal of the AAF from which flying equipment and trained personnel were drawn, and was also charged with research and development of military aircraft and related equipment, and ferrying planes from the factories. The other air units were those attached



The IL-2 Stormovik, soviet assault plane with a top speed of 335 m.p.h.

to the various defense commands, such as the Canal Zone, the Hawaiian department, etc.

One of the divisions of the newly created air staff was air war plans, headed by Col. Harold L. George. By Aug. 1941, this group had worked out a comprehensive air war plan which was submitted to the secretary of war and presented by the president to Prime Minister Churchill and the U.S. and British chiefs of staff at the meeting in August off the coast of Newfoundland. The plan called for the creation of an air force of more than 2,000,000 men and some 88,000 planes. (The actual peak was 2,372,272 in Dec. 1944, with 224 combat groups and 79,908 aeroplanes.) Assuming that the U.S. might be at war with Germany and Japan simultaneously, Germany as the centre of the axis system and its principal military power would have to be dealt with first, with a strategic defensive against Japan until Germany was defeated. Bases were to be developed in England and the Mediterranean for a sustained and powerful daylight bombing assault against specific targets in Germany on which its continued resistance depended, including as primary objectives the electric power system, the transportation system, the oil and petroleum system, worker and general civilian morale. Certain preliminary intermediate objectives were necessary, including neutralization of the German air force, air attacks on air bases, aircraft factories, aluminum and magnesium plants. To secure bases and maintain supplies, certain diversionary objectives were recommended such as attacks on submarine bases, surface sea craft and "invasion" bases. By and large, this air war plan turned out to be the actual U.S. air contribution to the Allied victory in Europe.

A division of office of the chief of air corps was the matériel division, headed by Brig. Gen. Oliver P. Echols, which handled on the air staff level the development and procurement of military aircraft and equipment at Wright field, under Brig. Gen. George C. Kenney. The following types and models of aircraft were in production and going into operational service by the autumn of 1941: heavy bombers, Boeing B-17D, Consolidated B-24; medium - bombers, North American B-25, Martin B-26; attack bomber, Douglas A-20B (similar to DB-7B Bostons supplied to Great Britain); fighters, Bell P-39C, Curtiss P-40B,C,D, Republic P-43A; cargo transports, Beech C-45 (light), Douglas C-47 (from DC-3), and a few Lockheed C-60s (from model 18 Lodestar). Still in squadron service were obsolescent Martin B-10 and B-12, Douglas B-18 bombers; Boeing P-26, Seversky P-35, Curtiss P-36 and a few P-40 fighters.

In 1941 Rear Admiral John H. Towers was chief of the bureau of aeronautics, U.S. navy. Some 15,000 naval aircraft were under development and procurement, with 34 naval air stations and three great naval air training centres at Jacksonville, Pensacola (Fla.) and Corpus Christi (Tex.). Seven carriers were in service, with 11 more being built. A goal of 25,000 planes and 30,000 pilots had been authorized for 1942–43.

In addition to pilots, a large number of enlisted men for air and ground crews as rated mechanics, ordnance and radiomen was required. To produce these quickly under the rapidly expanding program, two large schools for aviation ratings were established at Chicago, Ill., and Jacksonville, Fla., with a capacity of 10,500. Another 4,600 were under instruction at various air stations. Although 15,000 planes had been authorized in July 1940, as part of the president's 50,000 aeroplane program, only about 5,000 usable navy planes were on hand by Dec. 1941, as the aircraft industry did not get into its stride until well into 1942. Types included the Grumman Wildcat (F4F) fighter, Douglas Dauntless (SBD) dive bomber, Consolidated Catalina (PBY) patrol bomber, with the four-engine Coronado (PB2Y) and Martin Mariner (PBM) in production. Three important models were also under development, the Grumman Avenger (TBF) torpedo bomber, the Chance-Vought Corsair (F4U) fighter and the Curtiss Helldiver (SB2C) scout bomber. There were 41 air stations in the continental United States, not counting bases in Alaska and overseas. During 1940 and 1941 the Atlantic Neutrality patrol and extended exercises in the Pacific provided much needed operational training for the eight newly-organized patrol wings (for the coming anti-submarine warfare) and for other air units. All this became the groundwork for the most powerful naval air force in history.

China.—By the end of 1940 the Chinese air force had been almost completely knocked out. Chiang Kai-shek's government had been driven from its capital of Nanking, then from Hankow, and had been set up at Chungking, far in the interior. The Japanese air force made life miserable there by daily bombings. Claire Chennault, then a colonel in the Chinese army, kept loss of life at a minimum by an ingenious and extraordinarily reliable warning system. Chinese volunteers, with portable radios, lay hidden near the airfields in Japanese-occupied China, and reported enemy aircraft activity. Two wider circles of transmitters relayed the messages in time for protective action. As a by-product this proved to be invaluable training for the day when Chennault had some fighter planes.

An Ámerican air mission was sent to China in the spring of 1941. After a careful survey the three officers reported that China was in urgent need of modern combat planes, but that any supplied by the United States should be actually used by volunteer U.S. army air corps and U.S. naval or marine pilots, operating as an independent unit of the Chinese army. Chennault (then a brigadier general) and Gen. Mow went to the United States and quietly gathered recruits from some of the best young pilots available at army and navy training fields; they also recruited a service unit of ground crew chiefs who took an intensive course at the Allison engine plant before sailing for Burma. One hundred of the original Curtiss P-40 fighters rejected by the British as not suitable against the Me-109 were sent to China. Chennault and Mow also made provision for supplies of high-octane gasoline and .30 and .50-cal. ammunition. The men went over as civilians in comparatively small groups, were met by Chennault in Rangoon, and sent to Toungoo in interior Burma for intensive training in fighter tactics, Japanese methods, etc. while their base in western China was being prepared. Thus was born the American volunteer group.

Japan.-During the summer of 1940 Charles Day, aircraft production adviser to the Chinese government, reported that Japan had about 900 first-line combat planes in China under the imperial army air corps, with some 3,600 more distributed throughout the empire, equally divided between army and navy aviation; many of these planes were either obsolete or trainers. There were about a dozen major aircraft and engine factories, mostly on the main island of Honshu, and total production was estimated to be 300-400 per month, or about 4,000 per year. Although the army had more aeroplanes and personnel, the quality of both navy pilots and equipment was slightly better. The Japanese learned much in the air activities in China, and a good deal of practical German air force fighting "knowhow" was absorbed. All this was in preparation for the great effort which lay ahead, but which ended disastrously.

The Japanese used a rather complicated and ambiguous system of aircraft designation which consisted of four items: (1) manufacturer; (2) date of first production, using the last two figures of the Japanese year, which dates from the beginning of their empire, 660 B.C. (i.e., the Japanese 2599 is the Christian year 1939); (3) air force—army or navy; and (4) type. Examples: Mitsubishi 97 army heavy bomber (later called Sally); Nakajima 96 navy land attack bomber (later called Nell). This system was far too cumbersome for fast spotting and intelligence by U.S. forces, and the short form Mitsubishi Zero (for oo) was too confusing, as it could apply to a navy fighter, and army medium bomber or a land-based reconnaissance plane. Hence, early in the war, the air technical intelligence unit in the Southwest Pacific built up its own system, using short personal names for all known models of Japanese aircraft. Men's names were given to fighters and recco floatplanes, women's names to bombers, land-based recco planes and

U.S.-built P-63 fighter planes awaiting delivery to Russia under the terms of lend-lease. More than 5,000 of this type were flown to Russia during World War II, and 112 P-63s were supplied to the Free French Air forces

flying boats. The system was speedily adopted by all the Allies.

In the autumn of 1941 the Japanese army and navy air services had between 25 and 30 models of aircraft in operation. There were, however, six basic types, probably a leaf out of the German notebook. These were the Nakajima 97 army fighter (later nicknamed Nate, given here for convenience of identification); Mitsubishi oo Zero navy fighter (Zeke 11-navy's designations had two digits, one for the airframe, one for the engine; army's had one); Mitsubishi 97 army heavy bomber (Sally 1); Kawasaki 99 army light bomber (Lily 1); Nakajima 96 navy bomber (Nell 11); Kawanishi 97 navy flying boat (Mavis 11). Zeke (1940) and Lily (1939) were modern aircrast, but the others were four or five years old, as shown by their designations. Two other models were important at this time, the Aichi 99 navy dive bomber (later called Val 11), and Nakajima navy torpedo bomber (Kate 11), principal performers in the Pearl Harbor attack.

The Final Three Years, 1942-45.—In Nov. 1941 when Gen. Sir Claude Auchinleck launched his offensive in Libya, the German air force had about 300 aircraft in support of Rommel's Afrika Korps, including some of the new Me-109Fs. There were 100 Ju-87s, but Air Marshal Tedder's R.A.F., with gradual accessions of Hurricanes and Tomahawks (U.S. Curtiss P-40s) was beginning to pick them off in considerable numbers. The Italian air force numbered some 600 aircraft and was gradually modernized with the new Macchi 202 fighters powered with the German Daimler Benz 601 engine. The Savoia torpedo bomber force was effective against Allied shipping. Both the luftwaffe and the Regia Aeronautica, however, suffered from the fact that they were directly under the operational control of the ground commanders and were parcelled out to protect special sectors or to help advance small detachments, instead of being employed in concentrated mass. Goering transferred his main air fleet from the Moscow front early in 1942 to southern Italy and Sicily, the biggest gain being



272 150 Ju-88s. A concentrated attack on Malta allowed Rommel to receive reinforcements, but it cost the axis air forces hundreds of aircraft, especially after a U.S. aircraft carrier ferried in a couple of squadrons of Spitfires.

Rommel's threat to Egypt and the Suez canal was so alarming that in June Gen. Sir Harold Alexander was given over-all command in the middle east; General Bernard Montgomery was put in charge of the 8th army; the U.S. joint chiefs of staff ordered the activation of the U.S. army middle east air force, switching Maj. Gen. Lewis Brereton from New Delhi (10th air force) to Cairo with a single squadron of B-17 four-engine bombers, to form the nucleus of the 9th air force. B-24 Liberators, P-40 fighters and B-25 medium bombers followed soon after, while lendlease Martin Marylands and Douglas Bostons and a few long-range British Halifaxes added to the strength of the R.A.F. middle east. The North African ports were hammered remorselessly, Tobruk and Bengasi becoming so clogged with the hulks of axis ships that they could no longer be used. The aeroplane was beginning to prove itself an "interdictor" of battlefields. Rommel was beaten logistically before he was beaten tactically, with air power playing a decisive part in both aspects. Just before El Alamein (Oct. 1942) Gen. Brereton had a total of 164 aircraft and the R.A.F. 1,117. Opposed to them were about 1,000 German and 1,000 Italian planes of all combat types. The Allied air force set out to destroy them and by Jan. 1943 Rommel had lost 700 planes, many of them captured intact, unable to escape with dry gasoline tanks. The air forces rained destruction on Rommel's forces as he fled to Tripoli. The luftwaffe was beginning to be stretched out thin in a three-front war-western front desense, eastern front and Mediterranean.

In the meantime Anglo-American forces landed in Algeria in Nov. 1942, and the luftwaffe then had to support not only Rommel's Afrika Korps by Jürgen von Arnim's troops in Tunisia as well. By December the German air force in Tunisia amounted to about 150 aircraft, including three Focke-Wulf 190 squadrons from France which could be ill spared from the growing demands on air defense caused by the inauguration of daylight bombing missions by U.S. 8th air force B-17s based in the United Kingdom. Facing the luftwaffe, slightly augmented by a couple of dozen of the latest Italian Macchi 202s, was the newly formed U.S. 12th air force under Brig. Gen. James Doolittle, and a good assortment of R.A.F. Spitfires, Hurricane fighter-bombers, Blenheim IV (Mk. V, Bisley) medium bombers, and the new, fast, allplywood Mosquito reconnaissance plane. A show-down air battle with the luftwaffe in the Mediterranean seemed imminent, with numbers on the side of the Allies, but a slight edge in the quality of the single-engine Me-109G and Focke-Wulf 190 on the side of the Germans. The 190 was a first-class fighter, notable in its use of a BMW 14-cylinder air-cooled radial engine, streamlined cowling and ingenious cooling at all altitudes. The Me-110 was being replaced by the improved Me-210. Ju-87s had a few final flings in early 1943, but Allied fighters were too much for them and they were withdrawn to the Russian front. He-111s, Ju-88s and the improved Dornier 217E made up an effective antishipping bomber force with torpedoes and radio-controlled bombs, operating from bases in northern Italy and the south of France.

Following the Casablanca conference, the occupation of Tripoli, and the bringing up of powerful units of the R.A.F. middle east (designated as the western desert air

forces) and U.S. oth air force, a complete and important reorganization of the entire Allied air effort in the Mediterranean was effected on Feb. 18, 1943. The new organization was on functional air power lines and set the pattern for similar organization in Europe and in India-Burma. Air Chief Marshal Sir Arthur Tedder became Gen. Dwight Eisenhower's air chief, heading the Mediterranean air command, which included the northwest Africa air forces, Malta air force and eastern air command at Cairo. The air tasks to be accomplished were (1) air defense, (2) strategic air attack, (3) battle air attack, (4) air intelligence, including photographic reconnaissance, (5) airfield construction, (6) air supply and maintenance, (7) troop carrier operations and (8) operational training activities in the theatre.

By far the largest section was the northwest Africa air forces commanded by Lt. Gen. Carl Spaatz. For air defense of ports and shipping, a coastal command was set up under Air Vice-Marshal Sir Hugh P. Lloyd. A strategic air force for attacks on axis shipping, ports and air bases in Sicily and Sardinia was set up under Maj. Gen. Doolittle, to whom were assigned B-17 and B-24 day bombers, Halifax and Wellington night bombers, B-25 and B-26 mediums, and P-38 long-range escort fighters. Based on important principles of the use of air power learned in the western desert campaign, Air Marshal Arthur Coningham, Gen. Alexander's tactical air chief who worked in close co-operation with Montgomery's 8th army, was given command of a tactical air force. Its task was to prosecute an offensive air battle for the theatre as a whole in close collaboration with the ground armies, forming an air-ground team with daily, or even hourly joint staff planning and command. This represented a distinctive feature of the campaign, and set a pattern for the final victory in Europe and Asia. Other commands and organizations were formed based on the various air tasks mentioned above.

Coningham's tactical air force used a wide variety of aircraft, including U.S. P-38, P-39 and P-40, and British Spitfire and Hurricane fighters, practically all of them doubling in brass as fighter bombers on occasion. Airacobras (P-39) with their 37-mm. cannon and Hurricane IIds with their 40-mm. Bofors cannon did outstanding work as tank busters. Late in the campaign American Mustangs (P-51A with Allison engines) did notable work as low flying strafers and light bombers, or as swift, far-ranging army scouts, with a dive-bomber version (A-36) coming in just before the invasion of Sicily which was, if anything, even more effective. Tactical air force also had a tactical bomb force and Mitchells, Marauders and Blenheims which could be thrown against axis ground forces in any part of the theatre as the situation demanded. Thus by early spring 1943, the luftwaffe in the Mediterranean was faced with greater numbers and variety of aircraft and superior organization and tactical conceptions. Kesselring drove his units furiously, and desperate air battles ensued, but on the whole it was a losing game, and the German air force was badly mauled. It did a good job evacuating key personnel, including the use of large gliders, but attempts to fly in supplies of oil and gasoline ended disastrously. By May 1, 1943, the position in Tunisia had become untenable for the German air force, and the remaining units retired to Sicily and southern Italy for the vital battles they knew would be coming in the summer. In all North African campaigns the axis lost 5,156 aircraft destroyed in the air and 2,500 destroyed or captured on the ground.

In June Pantelleria was pounded into subjection by a terrific bombing barrage, July saw the invasion and overrunning of Sicily, and landings were made in Salerno in

September. A sudden switching of the entire Allied air strength, including heavy bombers from the Tripoli-based 9th air force, saved the day in a very critical situation. In October, the N.A.A.F. Strategic air force and all heavy bomber units of the 9th were combined in a new strategic air force to be based in Italy for heavy attacks on the axis from the south, the U.S. 15th under Gen. Doolittle. Gen. Brereton and his staff and all 9th tactical air units were secretly transferred to the United Kingdom to build up a new 9th (tactical) air force for the Normandy invasion. The old U.S. 12th air force, under Maj. Gen. James K. Cannon, became a tactical air force co-operating with Gen. Mark Clark's 5th army, while Coningham's T.A.F. and Air Vice-Marshal Harry Broadhurst's desert air force (R.A.F.) co-operated with Montgomery's 8th army. Gen. Alexander commanded all ground forces in Italy, with Tedder still chief of the Mediterranean Allied air forces (M.A.A.F.). By now the luftwaffe and what was left of the Regia Aeronautica were very much on the defensive, although on occasion a very real threat.

By the end of 1943, Gen. Eisenhower had set up his headquarters (later known as S.H.A.E.F.) in the United Kingdom and had taken his entire "first team of the air" with him in preparation for "Operation Overlord." This included Tedder, Spaatz, Doolittle. Brereton and Coningham. Thus, when Gen. Henry Maitland Wilson became commander in chief of the Mediterranean theatre, a new M.A.A.F. top organization was formed. Lt. Gen. Ira Eaker switched from the United Kingdom to become chief of M.A.A.F., which included the strategic air force (U.S. 15th, now under Maj. Gen. Twining, plus British night bombers) and the Mediterranean Allied tactical air force (M.A.T.A.F.), made up of the U.S. 12th (including French units flying B-26 bombers and P-47 fighters) and the R.A.F. desert air force.

From Jan. through Sept. 1944, M.A.T.A.F. flew some 250,000 sorties, dropped 140,000 tons of bombs, destroyed 840 planes, scored 120 "probables" and damaged 520; it lost 900 planes, mostly from German flak. M.A.T.A.F. destroyed or damaged more than 20,000 motor transports, 10,000 railroad cars and 1,200 locomotives. From March to May "Operation Strangle" choked off axis traffic above central Italy by knocking out bridges, blasting rail junctions, etc., and reduced such traffic to a mere trickle which crept along at night. This was followed by "Diadem" from May 11, a close co-operation task with the ground forces which punched through and captured Rome.

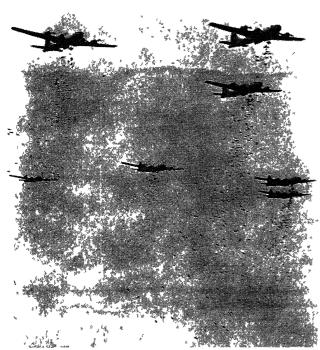
The Mediterranean Allied strategic air force concentrated on long-range bombing by day and night to destroy the axis' ability to produce for war. Targets included aircraft factories, ball-bearing works, power stations, oil refineries, synthetic oil factories, etc. Especially notable was the campaign of the 15th air force against Ploesti, Rumania, which began in April 1944, with 90% of the area's petroleum production knocked out by mid-August. Another feature was the shuttle-bombing between bases in Italy and Russia. Other noteworthy points included the air offensive against the Germans in Greece and the Balkans, aid to the Yugoslavs and the secret formation of the R.A.F. Balkan air force. All this was a distinct aid to the advancing Russian offensive in the south.

Eastern Front.—During the winter of 1941–42 the Russians continued their basic strategy of never allowing the German army or the luftwaffe time for a breathing spell. The 3,000 German aircraft on the eastern front in June 1941 had shrunk to some 1,700 by Feb. 1942, spread thinly along the 2,000-mi. front from Murmansk to the Black sea. This was a hopelessly inadequate force to cover that

first winter's retreats of the German army. Lack of reconnaissance units was a particularly serious handicap. The luftwaffe's outstanding achievement was the supplying of the surrounded 16th German army by air in atrocious weather and often in the face of Russian tank fire, a humble role for the once cocky and offensively spearheading luftwaffe.

By June 1942 the German air force had built up first line strength in the east to about 2,500 aircraft, but with a much lower percentage of reserve aircraft, pilots and crews than the year before. The increasingly formidable R.A.F. night bombing raids on the Ruhr cities, and the growing Anglo-American air strength in the Mediterranean had created critical air fronts which drained off twin-engine and single-engine fighter units from the eastern front. This was especially serious as it was in the fighter category that the soviets had made their greatest gain. The new fighters were designed around V-type liquid-cooled engines by Mikouline (AM-35A, 1,250 h.p.) and Toupolev (M-38, 1,300 h.p.), and included the MIG-3 (I-18, I-61) with inverted gull wings, the YAK-1 (I-26), and the first deliveries of the all-plywood fighter LAGG-3. During 1942 the IL-2 Stormovik, one of the outstanding attack planes of the entire war, began its devastating career against German tanks. Early versions had two 20-mm. cannon and four .55cal. machine guns. The later two-seater versions (IL-4, with pilot and gunner) carried 32-mm. cannon, unusually heavy for wing installation. For dive bombing missions the IL-2 carried four 250-pound rocket bombs or one 1,000pounder. The twin engine YAK-4 and PE-2 were often used on tank-busting or general ground assault missions, as well as high-speed level bombing. The only new German aircraft on the Russian front in 1942 was the improvised anti-tank plane, the Henschel 129 re-engined with French Gnome-Rhone radials of 880 h.p. (which gave trouble) and fitted with a 30-mm. cannon. Another diversion of aircraft from the Russian fighting front itself was the force of 100 to 150 long-range He-111s and Ju-88s manned by highly specialized antishipping crews which carried out devastating attacks against the Anglo-American convoys carrying supplies of aircraft, tanks, equipment and food to Murmansk. A further tipping of the scale in favour of Russian fighter aircraft forces was the increasing flow of Allied models, especially thousands of Bell Airacobras (P-39) and Kingcobras (P-63) of which the Russian pilots were especially fond, P-40s and Hurricanes. It was this fighter edge over the luftwaffe which became an important factor in driving German air force units too far from Stalingrad to help Friedrich von Paulus' 6th army when the Russians launched their counteroffensive after the heroic resistance at that city.

From 1943 to the end of the war, the German air force was compelled to put most of its efforts into the defense of Germany itself, with conservation and improvisation the order of the day. With a few notable exceptions such as in March-April 1943, in supporting the German army counterattack which retook Kharkov, the luftwaffe in the east constantly found itself attempting in vain to stave off the first effects of the repeated attacks of the red army, made at widely scattered points on the long fighting front. The Russians were calling the shots, and on the whole retained the initiative up to the final day of reckoning. There were always at least four separate military fronts to support, with a German air force averaging about 1,700 aircraft. In the southern sector, a small Hungarian air force using obsolescent aircraft and a Rumanian air force



Formation of B-29s releasing incendiary bombs over Japan in June 1945. A huge fleet of these Superforts completed the heaviest raid of the war on Aug. 1, when 6,871 tons of explosives were aimed at strategic targets on the Japanese homeland

of some 200 planes (Me-109, Ju-87, Ju-88) made a useful contribution to a losing cause.

The Germans launched a final supreme offensive effort in July 1943 in the Belgorod sector, the German air force mounting some 3,000 close-support sorties per day. The Ju-87 stuka had a short-lived field day in its attacks against soviet armoured vehicles, guns and troops. The soviet air force, however, strengthened by large accessions of U.S. P-30 fighters (flown via Alaska and Siberia), and a considerable number of Douglas A-20 and North American B-25 attack bombers, were also able to put up 3,000 sorties, with far greater reserves in depth, and the luftwaffe bolt was soon shot. Soviet counterattacks near Orel and near Stalino on the Donets front caused the German air force units to be dispersed again. Thereafter, the only offensive efforts of the luftwaffe in the east were in connection with local German counterattacks to save large sections from being dangerously outflanked.

By the autumn of 1943 Smolensk had fallen, the Germans had withdrawn to the Dnieper and the German air force had been whittled down to about 1,500 aircraft-1,000 from the Black sea to Kiev, 500 from Kiev to the Baltic. More fighter units had been shifted to the west to meet the rising might of U.S. daylight bombing attacks. Bomber units had also been transferred to bolster Kesselring's air forces in the Mediterranean as Italian bomber squadrons dropped out after the capitulation of Italy. Air reconnaissance was so inadequate that the soviet army achieved tactical surprise in practically every attack. Despite the handicaps of being stretched far too thin, of lacking planes and supplies and of being overwhelmed in the air by ever increasing soviet air force superiority, the German air force in the east managed to fight and fly with intensity and determination in an effort to hold off a German ground disaster. In the spring of 1944 the luftwaffe

performed heroically to cover the German withdrawal from the Crimea. June 1944 brought the long-awaited second front in the west, and a few weeks later the soviet army, in a surprise move, began its great offensive in the extreme north, with break-throughs in the central and southern fronts following in due course. The German air force was utterly helpless to stem the tide.

Western Front.—In the air war against Germany, Feb. 1942 was a month of highly critical beginnings. Air Marshal Arthur T. Harris had just become chief of the R.A.F. bomber command, with marching orders to put into effect Sir Charles Portal's "master plan." This plan called for the defeat of Germany by means of the strategic use of air power. Heavy night bombing attacks were to damage or destroy industrial installations in a master list of 60 important war production cities, 40 of which had top priority. This same month saw the arrival in England of Brig. Gen. Ira C. Eaker with a handful of key officers to spearhead the U.S. 8th air force bomber command which was to carry the British plan a step further by attempting to attack in daylight, not industrial cities, but vital parts of key industrial factories, using fast, heavily armed fourengine bombers. It was a scientifically worked out air program of which the number one objective was the destruction of the German air force, to be followed by the destruction or disruption of German war industries. After aircraft and engine factories came oil, synthetic and natural, transportation and communications, ball and roller bearings, chemicals, ordnance, tank and truck factories the blood, arteries and sinews of modern war.

Air Marshal Harris advocated "saturation" raids, concentrated and sustained, to overwhelm the German defense by ever-increasing numbers of aircraft and weight of bombs. The Germans thought they had dropped a lot of bombs when they unloosed 250 tons on Coventry, but the first raid of Harris' regime, March 3-4, 1942, saw 460 tons dropped within 115 minutes against the huge Renault works at Billancourt, near Paris. This rate of four tons per minute was only a start. The majority of the bombers were four-engine Stirlings and Halifaxes, carrying eight and six tons of bombs on relatively short runs. A good example of a special mission was the spectacular 500-mi. daylight raid on April 17, 1942, of 12 new four-engine Lancasters against the factory in Augsburg, Bavaria, which made half the diesel engines for U-boats. By a maximum effort the great Ruhr city of Cologne was blasted on May 30-31 by 1,043 bombers dropping 3,000 tons of bombs in 90 minutes (33 tons per minute), with a similar attack on Essen two nights later, and another on Bremen, June 25-26. These 1,000-plane raids were very much the exception at this period, but they did considerable damage and illustrated what Harris meant by saturation raids. Other principal cities attacked by the R.A.F. included Luebeck, Rostock, Duesseldorf, etc.

In March 1942, the army air forces was constituted as one of the three main divisions of the U.S. army, with Lt. Gen. H. H. Arnold as commanding general. Gen. Arnold was in London during the Cologne and Essen raids, and he promised that the day would come when the U.S. air force would carry out 1,000-bomber missions in daylight against vital German targets. A few weeks later, the existence of the U.S. 8th air force headquarters in the United Kingdom was announced, with Maj. Gen. Carl Spaatz as commanding general and Brig. Gen. Eaker as chief of bomber command, and a total of some 420 combat aircraft. The first U.S. daylight bombing mission was on Aug. 17, 1942, against the railway yards and shops at Rouen in occupied France. German fighter reaction was sharp, but no

B-17s were lost in the first few missions, and the powerful .50-cal. guns in the various turrets and stinger tail brought down several Me-109s and Focke-Wulf 190s on each mission. Up to the end of 1942 the pioneering first wing of the 8th bomber command flew 23 missions against objectives in German-occupied Europe, inflicting substantial damage, shooting down 104 planes, with 108 probably destroyed and 117 damaged. Eighteen Flying Fortresses were lost, 13 by fighters and 5 by flak. However, owing to the diversion of aircraft, personnel, training and maintenance to the newly created 12th air force for the North African campaign, the efforts of the 8th bomber command was reduced to a trickle, and a showdown seemed imminent. At Casablanca, Gen. Eaker completely satisfied the combined chiefs of staff that the U.S. bomber force with its specialty of daylight bombing should be built up, giving half a dozen solid reasons why this would complement the R.A.F. night effort in a highly effective manner. Air Marshal Harris backed him to the hilt, and Operation Pointblank was authorized. This resulted in a directive which was of the highest importance in the European victory, and which ordered a combined "British-U.S. air offensive to accomplish the progressive destruction and dislocation of the German military, industrial and economic system and the undermining of the morale of the German people to the point where their capacity for armed resistance is fatally weakened." It was to be the AAF by day and the R.A.F. by night. Lt. Gen. Frank M. Andrews, pioneer of U.S. air power and commanding general of the G.H.Q. air force from 1935 to 1939, was transferred from his post in Cairo as middle east commander, to England as commanding general of European theatre of operations, U.S. army. The air forces and then the ground forces were to be built up for the coming invasion (Operation Overlord).

According to the revised plan for the combined air offensive the high priority cities for night bomber attack were reduced to 30-6 in western Germany, 16 in central Germany and 8 in eastern Germany, too far away to be attacked frequently. The key rail centre of Hamm was also bombed repeatedly. In the two years from March 1943 when the battle of the Ruhr began, most of the 22 key cities in western and central Germany were blasted over and over again, some of them being finally knocked completely out of the war as military industrial threats. The increase in bomb tonnage dropped during 1943 told the story: 1st quarter, more than 17,000 tons; 2nd quarter, more than 36,000 tons; 3rd quarter, 40,000 tons; 4th quarter (with bad weather), 42,000 tons. In a normal mission overwhelming numbers (400-500) of four-engine Lancasters, Halifaxes and Stirlings (replacing the Wellingtons, Whitleys and Manchesters of the 1940-41 era) dropped 1,000-1,500-ton loads in sustained attacks, sometimes several against one city within a week or ten days. The AAF meanwhile sandwiched in a daylight mission or two, as in the case of Hamburg, in late July 1943.

Concurrent with these saturation attacks were the highly irritating individual attacks, mostly against Berlin, nervecentre of the entire nazi system, by elusive, high-speed Mosquito bombers. With German air defense further thinned out by the growing threat of the U.S. daylight missions, R.A.F. night bomber losses were held below the 4% average. German night fighters were well organized; the Germans' radar warning system, air-borne radar, and the deadly flak were all effective; but the overwhelming numbers, and the fast, concentrated raids were too much for them. By November 1943 the R.A.F. was in a position to carry out a series of concentrated attacks on Berlin.

After Feb. 15, when 2,500 tons of bombs were dropped in 30 minutes (80 tons per minute), it was found that some 326 factories had been destroyed or damaged after November, more than 100 of them of prime importance to the German war effort. It was also estimated that three-quarters of Berlin had been destroyed.

On the daylight side of the combined bomber offensive, the 8th air force mounted its first 100-bomber mission in March 1943. A series of heavily damaging precision attacks, including Vegesack (submarines), Renault (tanks and trucks), and the Focke-Wulf factory at Bremen caused the Germans to build up flak and fighter defenses around the most vulnerable areas and thus definitely weaken the G.A.F. on the Russian front. By late spring new units had arrived, and it became possible to send multiple attacks; B-17 heavies went to one target with powerful P-47 Thunderbolts escorting part way, and B-26 mediums to another target, splitting the German air defensive effort. June and July saw longer range and heavier multiple attacks, with the first daylight penetration of the Ruhr. In late July Brig. Gen. Fred Anderson, chief of the 8th bomber command, loosed his first concentrated attacks on the German single-engine fighter complexes, where Me-109s and Fw-190s were built and assembled.

August 17, first anniversary of the initial daylight mission, was celebrated by sending a huge mission of B-17s and B-24s against the ball-bearing factory at Schweinfurt, and another against the Me-109 factory at Regensburg. Both targets were fiercely defended and losses were about 15%. This was far too high and pointed up the need of fighter escort all the way. The second big attack on Schweinfurt (Oct. 14) saw 60 bombers destroyed out of 320 dispatched (more than 18%), many of them having been shot down by twin-engine fighters armed with air-to-air rockets. From early November, however, the tide turned. P-47s and P-38s with external drop tanks provided fighter escort all the way to the target. Losses dropped sharply to less than 2% per mission; bombing accuracy increased, and 8th bomber command morale soared. A few weeks later, the Merlin-powered Mustang (P-51B, later the D) came into the picture for deepest penetration missions (800 miles and back), soon to be almost universally conceded the outstanding escort fighter of the war.

The leaders of the luftwaffe were frantic. Nearly two years before they had switched to the defensive, with single-engine fighters up 375% from Jan. 1942 to Oct. 1944 and long range bombers off 85% in that same period. The R.A.F. area bombing at night did a lot of damage and drew well-organized night fighter interception, but it was the AAF daylight attacks that made the luftwaffe really come out and fight; this was a prime objective of the Casablanca directive.

From November on, the weather over the continent was so bad that sustained attacks were almost an impossibility. After the summer of 1942 highly trained R.A.F. "path-finder" crews had led the big night bomber formations to their targets by means of a search radar set in the S band, dropping flares as guidance for the others. By Nov. 1943, a few sets of an improved model in the far more precise X band had been developed by the Radiation laboratory at the Massachusetts Institute of Technology, Cambridge, and were operationally tested by the 8th air force. Within a few months this bombing through overcast became an important factor in maintaining a sufficient weight and frequency of attacks to keep up the job which was strategically required.

Jan.-March 1944, saw an all-out effort to destroy the sources of luftwaffe fighter production. The 8th bomber command had about 2,000 B-17s and B-24s in three air divisions, and the 15th bomber command in Italy had 900 bombers (mostly B-24s) in 17 heavy bomb groups. Long range fighter escort was at last available on something like an adequate scale. This was U.S. strategic air force. The R.A.F. bomber command was ready to throw in its entire weight in co-ordinated night attacks. Jan. 11 saw a big attack by 720 bombers on three of the factories. Five weeks later, during a week of reasonably good weather, U.S.S.T.A.F. and the R.A.F. let loose a hurricane of air power against the factories where the Me-109, Fw-190, Ju-88 (now a rocket-carrying day and night fighter), Me-110 and Me-410 were turned out. That week changed the history of the air war. From that time on the luftwaffe rose to battle only when it believed it had local air superiority or when highest priority targets (such as synthetic oil plants) were under attack. The pay-off was the fantastically weak air reaction on D-day, Normandy, 15 weeks later, when the Allied invasion forces provided the most magnificent military target ever offered an enemy air force.

Following blitz week against the aircraft industry, the combined strategic bombing offensive could turn to the main business of destroying Germany's means of continuing the war. The war could not be fought without oil, in huge quantities. The over-all plan for the oil campaign was begun in April 1944, and called for the destruction of 24 synthetic plants and 80 refineries, in six main districts. Three in the Hamburg-Hanover area were assigned to the 8th air force; Silesia, Vienna and Ploesti were assigned to the 15th, with the R.A.F. coming in later for special co-ordinated raids as required. The effect was catastrophic, oil production being cut in half by June with reserves shrinking dangerously. By autumn the luftwaffe, already weakened by the attack on the aircraft factories, was seriously affected by lack of oil and fuel. Training was cut to the bone. It was in this stage that the Me-163 Komet rocket intercepter and the Me-262 Swallow twinjet fighter, using chemicals and diesel fuel respectively, were thrown into battle to the fullest extent possible. Their speed gave them an edge on Allied fighters, but it was a case of too little, too late. If the war had been prolonged another six or eight months, the new jet fighters and highly ingenious rocket powered guided missiles might have robbed the Allies of air supremacy, rendered the big bomber missions militarily uneconomical and jeopardized the entire victory in Europe. The campaign against oil, however, followed by the devastating attacks against transportation in the winter and spring (1944-45) in co-operation with the ground forces actually brought about the coup de grâce. This was according to the explicit testimony of many of Germany's top military leaders. The wehrmacht literally ran out of gas.

Meanwhile, preparations for Operation Overlord were rapidly accelerated early in 1944. On the U.S. side Gen. Brereton's 9th air force was organized as the 9th bomber command, with late model A-20 light bombers and a huge fleet of B-26 mediums, and the 9th, 19th and eventually the 29th tactical air commands, each to team up with one of the U.S. armies being trained for the invasion. The T.A.C.s had a force of P-47s, P-38s and P-51s to be used as fighters and fighter bombers, with photo P-38s (F-5s) for longrange reconnaissance, and some of the P-51s for tactical reconnaissance or scouting. Troop carrier command prepared for airborne operations on a huge scale. New radar

techniques, especially for fighter control, had to be learned, and the use of the new five-in. high velocity aircraft rockets became a part of the last-minute operational training program.

The British counterpart was Air Marshal Coningham's 2nd tactical air force (2nd T.A.F.) for co-operation with the British ground armies. Second T.A.F. and the 9th combined to make up the Allied expeditionary air forces, under Air Marshal Sir Trafford Leigh-Mallory, who thus became Gen. Eisenhower's chief of tactical air operations, under his deputy, Air Chief Marshal Tedder. Second T.A.F. operated with Spitfires, Typhoon fighters and fighter-bombers (including rockets), Mosquitoes and other tactical types.

All through the spring of 1944 as these tactical air forces were being built up they continued the drive begun by the R.A.F. in 1942 to push farther and farther back from the coast the hundreds of large airfields the Germans had constructed throughout France, Belgium and the Netherlands. At the same time a drive was begun to wreck the transportation system so that troops could not be moved in fast enough to oppose the Allied build-up. Low-flying Typhoons, Mustangs and Thunderbolts were especially effective in blowing up locomotives, ammunition trains, etc. In May a concentrated campaign was carried out to cut off Normandy and Brittany by knocking down all the rail bridges across the Seine and the Loire rivers. This new large-scale Operation Strangle, the destruction of airfields, repair bases and of more than 5,000 German aircraft by the tactical air forces alone from January to June, plus the shattering attacks of the AAF and R.A.F. strategic air forces during that same period, cleared the air for the Allied invasion.

To seal off the invasion area the night before D-day, the R.A.F. dropped 5,000 tons of bombs on five important rail yards and on crucial German batteries. German radar stations had been knocked out the day before. At dawn 1,500 U.S. heavies smashed German installations up and down the coast, putting most of the defenders into a daze. More than 1,000 C-47 transports and long trains of gliders had carried some 31,000 airborne troops behind German lines, with the relatively light loss of 26 C-47s and a few of the gliders. The great armada taking Allied troops to the Normandy beaches was covered by the greatest umbrella of aeroplanes ever gathered together. There were more than 4,300 sorties by the 8th air force, 4,800 by the 9th and 2,000 by R.A.F. 2nd T.A.F. Fewer than 50 German planes appeared the first day; more came the second day and each side lost a couple of dozen aircraft. By the end of the third day the Allied air forces had made 27,000 sorties and lost 289 aircraft, mostly to flak. The German air force still had not come out in strength, and it lost only 176 planes—but they lost northern France.

After a stalemate around mid-July, a terrific air barrage on July 25 near St. Lo changed the outlook almost overnight. Hodges' 1st army, under cover of a cloud of Gen. Ellwood R. (Pete) Quesada's 9th T.A.C. fighter bombers, broke through, rolling up the German flank and starting a war of movement. Gen. George Patton's 3rd followed through a few days later, and with its flank protected by Gen. Otto P. Weyland's 19th T.A.C., raced on and reached Paris in two weeks. It was one of the most daring and brilliant campaigns of the war.

By the end of August Gen. William H. Simpson's 9th army was in the field and with it Gen. Richard A. Nugent's 29th T.A.C. The three 9th air force T.A.C.s and the R.A.F. 2nd T.A.F. kept on a continuous raid of destruction, forcing the Germans into the open, or herding them into pockets

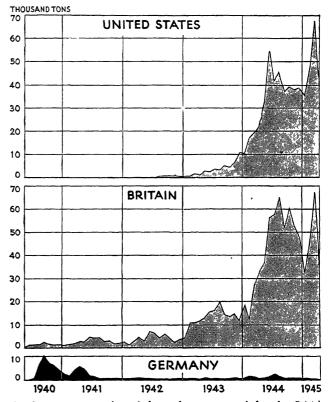
where they were captured by the thousands. In one day (Aug. 18) in the famous Falaise pocket, Coningham's 2nd T.A.F., operating with Montgomery's armies, destroyed-1,159 motor vehicles, damaged 1,724, destroyed 104 tanks and damaged 96. Air-ground co-operation at all levels, joint headquarters, army, corps and division was of the best, with air liaison officers who were themselves pilots and knew what air could and could not do, were attached to each division and called the shots. In the midst of bad weather radar equipment performed miracles, enabling Allied forces to see what was ahead. For greater mobility and for strategic drops behind German lines, British and U.S. airborne forces were organized into the 1st Allied airborne army under Gen. Brereton, a top command with direct access to S.H.A.E.F. for quick orders or confirmation of vital decisions in a rapidly changing situation. With Gen. Eaker's Mediterranean Allied air forces as cover, the U.S. 7th army under Gen. Alexander Patch landed in the south of France in mid-August, and still another T.A.C. was organized, known as the 1st tactical air force (provisional), including U.S. and French units. This new airground team pushed rapidly up the Rhone valley.

The only serious set-back to the Allied advance on all fronts was the counterattack by Karl von Runstedt in the Ardennes on Dec. 16, which called for a quick thrust west and then north to cut off the Allied armies east of Liége, Brussels and Antwerp. Zero-zero flying weather kept Allied air power grounded, and the break-through made considerable headway. On the sixth day the weather broke and the T.A.C.s went into action, smashing towns, rail junctions, bridges, airfields, supply dumps, tanks, vehicles and troop concentrations, dropping 104,000 tons of bombs in 12 days, destroying more than 1,400 German planes (one of the last big reactions of the G.A.F.) and losing about 600, only 50 of these in air combat. By now the luftwaffe was about through. Before the Rhine crossings in March, the AAF knocked out all the jet fighter bases, first in the north and then in the south, and then joined the R.A.F. in the most concentrated smashing of communications in the history of warfare. The wehrmacht was badly cut up, and Russian troops from the east, and Anglo-U.S. troops from west and south completed the victory by early May.

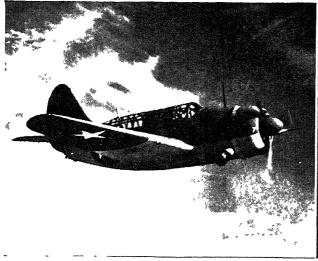
Japan vs. U.S. and Allied Air Forces.-According to Japan's original strategic plan, the Japanese army was given primary responsibility for conquering Malaya, Sumatra and Burma, with air support in northern Luzon. The Japanese navy, following the attack on Pearl Harbor, was to be responsible for operations in the Philippines, Borneo, Celebes, Java, northern New Guinea, the Bismarck archipelago and out to the Gilbert islands and Wake. The air order of battle on Dec. 7, 1941, was as follows: The army had four flying divisions and one flying brigade, totalling 1,375 aircraft, with 550 for the Malayan campaign, 175 for the Philippines, 150 in China, 450 (reserve) in Manchuria and 50 in Japan. The navy had a total of 1,250 aircraft, in four air flotillas (300 for the Philippine campaign, 150 Malayan campaign, 50 for the Marshalls); a carrier force of 6 with 400 planes for Pearl Harbor; 75 seaplanes attached to surface vessels of the combined fleet; and 275 miscellaneous aircraft in Japan.

Facing the Japanese, the United States and its Allies had the following land-based air strength (or weakness?) in the Pacific: U.S. army and navy air forces, 593 aircraft (182 in the Philippines, 12 Wake, 12 Midway, 387 in Hawaii); royal Netherlands Indies air forces, 200 planes; royal air force, 332 aircraft in Malaya; royal Australian air forces, 165 planes in Australia, Solomons, Netherlands Indies and Malaya. Most were of obsolete types.

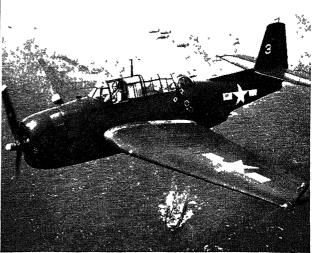
Thus a grand total of 1,290 Allied planes, most of them thousands of miles away from home bases, had to face 2,625 Japanese army and navy planes, more or less on their own home grounds. We have seen the composition of the basic Japanese air team. Following is a brief comparison with the AAF-Navy team, model for model. To meet the agile carrier-based Mitsubishi Zeke 11 (widely known as the Zero), navy and marine pilots had the tough, hardhitting Grumman Wildcat (F4F) for carrier operations and on Guadalcanal, where the Marines also had some P-400s (export version of the early Bell P-39 Airacobra) and AAF pilots had Curtiss P-40s. In Burma-China, to meet the Japanese army fighters, Nakajima Nate and Oscar, the Flying Tigers and China air task force (after July 4, 1942) had rugged Curtiss P-40Bs (4 x .50-cal. guns) and P-40D Warhawks (6 x .50s). The Aichi 99 navy dive bomber Val 11 had an opposite number in the Douglas SBD-3 Dauntless, destined to become the scourge of the Japanese fleet and shipping for the next two years. The Nakajima torpedo bomber Kate 11 was matched by the Douglas TBD Devastator, replaced from the battle of Midway on by the faster, more powerful Grumman TBF Avenger. The Kawanishi four-engine flying boat Mavis 11 was stacked against the stalwart Consolidated PBY Catalina, which with but two engines lacked the range of Mavis. Until the summer of 1942 in China the Japanese army bombers Lily (Kawasaki 99) and Sally (Mitsubishi 97) and navy bomber Nell (Nakajima 96) were the only bombers in the skies, but in July a handful of North American B-25 Mitchells were flown in from India for Gen. Chennault's China air task force, where they put on a performance out of all proportion to their numbers. At no time did the



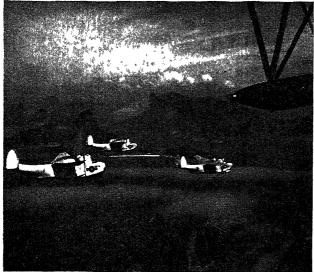
Bombing statistics adapted from charts prepared for the British Chiefs of Staff committee during World War II. Top and centre: Bomb tonnage dropped on axis and occupied territory by U.S.A.A.F. 8th bomber command and the British bomber command respectively. Bottom: Bomb tonnage dropped by the luftwaffe over Great Britain.



Curtiss Helldiver SB2C, navy scout bomber which combined range, speed and armament



TBM Avenger, carrier based navy torpedo bomber



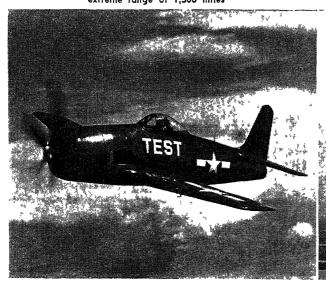
Above: The Martin Mariner, patrol bomber seaplane which guarded navy convoys during World War II

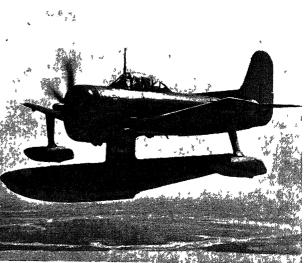


Above: Chance-Vought Corsair F4U-4, U.S. navy fighter plane used by U.S. marines with great effect

Below: Grumman Bearcat F8F, lightweight navy fighter, with a climbing rate of 5,000 f.p.m., top speed of 425 m.p.h., and an extreme range of 1,500 miles

Below: The Seahawk SC-I, high speed float plane, used as a spotter for cruiser and battleship gunfire during U.S. naval operations in World War II





Japanese have a bomber which approached the Boeing B-17E (with stinger tail guns, operational after April 1942) in speed, range, bomb load and defensive fire power, and only toward the end of the war did their medium bombers catch up with the B-25 and the Martin B-26 Marauder (one or two were actually faster and had greater range). On the other hand not until the arrival of the Lockheed P-38 Lightning and Vought F4U Corsair in early 1943 did the Allies have a fighter which could climb and manoeuvre with the Zero (Zeke 11).

Except Nate, which was powered by a nine-cylinder engine of 950 h.p., all of the Japanese aircraft of the 1941-42 period were powered by three principal models of 14cylinder, twin-row, air-cooled radial engines. These were the Mitsubishi Kinsei 40 series, Nakajima Sakae 10 series, and the Mitsubishi Kasei 10 series. The Kinsei and Sakae line ranged from 950 to 1,050 h.p., and were very similar to the Pratt & Whitney R-1830 twin-row Wasp, then rated at 1,150 for take-off, which had been sent to Japan in the late 1930s for production under licence. The Kasei series was more powerful (1,350 to 1,450 h.p.), and compared with the 14-cylinder Wright R-2600 Double Cyclone, rated at 1,600 h.p. Improvement of these engines, and the bringing into production of the compact 18-cylinder 1,800-h.p. Nakajima Homare engine, were important factors in the better performance of later models of the original fighters and bombers, and of the really excellent performance of the new aircraft which were just beginning to make their appearance a few months before the end of the Pacific fighting.

Despite set backs in the all-air sea engagements in the Coral sea and at Midway and Dutch Harbor, the Japanese by July 1942 had established an immense perimeter of conquest in the far east, extending more than half way across the Pacific and westward to the mountain barriers of the India-Burma front. Its swollen empire included a powerful interlocking system of air bases, with literally hundreds of airfields stretching from Formosa to Burma, Malaya, the Netherlands Indies and on through New Guinea to the Solomons. There were powerful air and naval bases in the Gilberts, Marshalls and Carolines. Japan, however, had two fatal weaknesses, its great dependence on shipping, and the vulnerability of its industrial cities to attack by land-based heavy bombers. Thus U.S. strategy was set for a war of attrition against Japanese shipping, along with a thrust straight toward the home islands for heavy bomber bases. At midsummer 1942, however, the main thing was to stop the Japanese advance, and at times it was a desperate business.

During this defensive phase, lasting from Dec. 1941 to about Feb. 1943, the U.S. army air force effort was limited to tactical targets, such as rendering Japanese airfields unserviceable, destroying aeroplanes to dampen the Japanese air offensive, and attacking shipping to disrupt supply and reinforcements. Besides the defensive engagements of the Coral sea, Midway and Dutch Harbor by naval air forces, with substantial assists from the AAF, carrier task forces under Admiral William Halsey conducted hit-andrun raids against Japanese bases in the Central and South Pacific during the first six months of 1942. After Coral sea and Midway the Japanese had but five carriers fit for action, only one of them large. A balance of naval air power in the Pacific, and thus a balance of naval power as a whole, was achieved at Midway, which the Japanese admirals regarded as the turning point of the war.

In late July 1942 Japanese forces landed in New Guinea in an effort to capture Port Moresby. The 5th air force under Maj. Gen. George C. Kenney cut their communica-

tions by air attacks, and by flying in and supplying an entire division of ground troops saved the day, capturing Buna and Gona in Jan. 1943.

In early Aug. 1942 a surprise landing by U.S. marines was made on Guadalcanal, which after bitter land, sea and air fighting was secured by Feb. 1943. The South Pacific theatre commander (from October) was Admiral Halsey, and in Jan. 1943 army air force units, some of which had been in the theatre after Feb. 1942, were organized as the 13th air force under Maj. Gen. Nathan S. Twining, with former Chief of Air Staff Lt. Gen. Millard F. Harmon commanding all army forces in the theatre. From this time on the South Pacific air command was on a quarterly rotating basis, held successively by navy admirals (including Aubrey W. Fitch and John S. McCain), AAF generals (including Twining), and marine generals (including Roy S. Geiger and Louis E. Woods). Although U.S. losses in the Guadalcanal and New Guinea (Papuan) defensive operations had been heavy, the Japanese suffered a crucial strategic defeat. Their advance had been stopped, their strategic plan fatally upset. Most of their best navy pilots who had survived Midway, and some of their best army air units, were lost.

Despite all this, the Japanese retained the advantage of position, and could replace pilots and planes by sending them on relatively short hops over their chain of island bases. U.S. air forces still had the tremendous handicap of distance. Hence the next few months proved to be a fairly evenly matched holding period while the AAF navy-marine air strength was being built up. In the South Pacific new B-17 and B-24 Liberator units added greatly to the sphere of effective bombing and search missions, and B-26 and marine B-25 mediums were also based on the rapidly enlarged facilities on Guadalcanal. Twin-engine Lightnings added greatly to the range, speed and ceiling of AAF fighter capabilities, and the marine-flown Corsair began its career as one of the outstanding land or carrier based navy fighters of the war.

Except for the marine Corsair fighter and Dauntless dive bomber, the above equipment was also characteristic of the 5th air force in New Guinea (headquarters and rear base in Australia), plus the useful Douglas A-20 attack bomber. In both theatres the C-47 (navy R4D) DC-3 type transports did an indispensable job. The Japanese by now also had some improved models and new planes in the air, including the clipped-wing Zero known as Hamp (later Zeke 32), Tony, with an in-line engine, Rufe (Zeke 11 with floats), improved navy bombers Nell 22, Betty 22 and 24, and the flying boat Emily. Their threat, however, was largely based on numbers and availability and not on superiority to U.S. models.

On June 30, 1943, the great double-pronged drive planned in the spring by Admiral Chester Nimitz and Gen. Douglas MacArthur got under way, ending the holding phase and beginning the offensive which a little more than two years later brought the surrender of Japan. This called for: (1) reconquest of the central Solomons to neutralize the great base of Rabaul and clear the decks for the Central Pacific power drive, spearheaded by fast carrier task forces and long-range blows by the 7th air force; (2) an army leapfrogging campaign across the northern New Guinea coast for the springboard to the Philippines, spearheaded by the 5th air force, assisted by the 13th.

The offensive began in May in the North Pacific, army (11th air force) and navy air squadrons co-operating with U.S. landing forces to clear the Japanese from the Aleu-

tians in the world's toughest flying weather. Attu fell on May 30, 1943, catching Kiska in a pincers, and the Japanese forces were driven out, sneaking away in early August. Attu was converted into a heavy bomber base, and from then on army Liberators and Mitchells and navy Venturas, aided by the Loran electronic navigation system, carried out search and strike missions against Paramushiru and other bases in the Kuriles.

In the South Pacific the offensive started up the ladder of the central Solomons, capturing the big airfield of Munda, New Georgia, on Aug. 7, 1943, which the seabees soon turned into a huge air base for the 13th air force, marine and navy air units. Other Japanese island bases in the Solomons were captured during the next few weeks, while ceaseless attacks were made against Rabaul. In November, landings were made on Bougainville, and big airfields for further advances were ready by the end of the year. The capture of Green island in Feb. 1944 completed the Solomons campaign.

In the re-conquest of New Guinea (S.W. Pacific theatre), Gen. Kenney's 5th air force accepted major responsibility for the three main aspects of tactical air power, later defined as gaining air superiority (phase one, operations), isolating the battlefield (phase two) and working in close co-operation with advancing ground forces (phase three). The battle of the Bismarck sea (March 3-5, 1943) was a classic example of phase two, in which a large convoy and several score Japanese planes were destroyed in a spectacular demonstration of minimum altitude bombing.

After destroying 309 Japanese planes at the big air base at Wewak in four days, largely by the effective use of low-flying planes dropping parachute bombs (parafrags), the New Guinea leapfrogging operation began in September 1943 with the capture of Salamaua, Lae and Finschafen, with brilliant tactics in the use of aviation engineers and air supply.

In March 1944 a force of B-24s with long-range fighter escort (P-38s and Republic P-47s with drop tanks) smashed 219 planes at Hollandia. In April Hollandia was taken in a long jump, by-passing Wewak, Admiral Marc A. Mitscher's task force 58 and the 13th air force (advanced units now based on Manus in the Admiralties) co-operated. Wakde and Biak islands fell in May, Noemfor and Cape Sansapor at the tip of New Guinea in July. Morotai in the Halmaheras was assaulted on Sept. 15, with landings in the Palaus on the same day. The next stop was the Philippines.

By Sept. 1943 the navy was ready in the Central Pacific. Admiral Mitscher's famous task force 58 (so designated as the 8th task force in Admiral Raymond A. Spruance's 5th fleet) began its free-ranging and practically irresistible campaign with a big raid on Marcus island, followed by others every few days on various Japanese strong points in the Gilberts, Marshalls, northern Solomons and Rabaul, the latter just preceding a tremendous air attack by Gen. Howard K. Ramey's 5th bomber command in New Guinea. The carriers of task force 58 were of the 27,000ton Essex class, carrying 80 to 90 aeroplanes-new Grumman Hellcat (F6F) fighters, Curtiss Helldiver (SB2C) scout bombers and Grumman Avenger (TBF) torpedo bombers, a powerful triple-threat team. The fast carrier task force included battleships, cruisers and destroyers in proportion, but the carrier was queen. There was also a new supplytrain setup which enabled the task force to stay more than 2,000 mi. away from its main operating base for weeks at a time.

In November the other member of the Central Pacific power-team, Maj. Gen. Willis Hale's 7th air force (which in April had taken a 2,000-mi. leap from Hickam field, Oahu, Hawaii, to Canton in the Phoenix islands and later to Funafuti) took a 1,000-mi. step toward Tokyo by moving into the recently captured Tarawa and Makin. From these bases in the Gilberts they joined task force 58 in hammering key Japanese bases in the Marshalls in preparation for the surprise capture of Kwajalein in late Jan. 1944, and Eniwetok a few weeks later. The fast-moving 7th air force soon moved into these bases in the Marshalls, while task force 58 went on to attack Truk and other Caroline bases. June and July saw the biggest amphibious operation to that date in the capture of Saipan in the Marianas, followed by Guam and Tinian, during which T.F. 58 had its greatest kill of Japanese planes in the chase known as the first battle of the Philippine sea. Capture of the Marianas bases, soon to be occupied by AAF 21st bomber command (B-29s), spelled the beginning of the end for Japanese imperial ambitions.

During operations around the Philippines in Sept. and Oct. 1944 carrier forces of Halsey's 3rd fleet dominated the air action. Mitscher's task force 38 (bigger and more powerful than his ubiquitous T.F. 58) had some 1,080 planes, and T.F. 77, with smaller carriers, had 600. Gen. Kenney's far eastern air forces (5th and 13th) had 1,460 planes with 525 in ready reserve, while the 7th in the Marianas, Palaus and Marshalls had 525 more. The important point at this stage was that the mobility of the carriers permitted massing of air power at a particular time and place. The Japanese navy and air forces missed a great opportunity shortly after the invasion of Leyte, but U.S. naval surface and air forces administered a decisive defeat. From a toehold on Tacloban air strip (Leyte), 5th fighter command plus a force of B-25s sank convoy after convoy. Landings on Mindoro in December permitted the 5th air force to bring up its main bomber strength, releasing the carriers for other duties, and this was the beginning of the end of the Philippines campaign. They not only destroyed 2,000 Japanese planes, but rendered all airfields and repair facilities completely unserviceable.

From Luzon in January B-24s, B-25s, P-38s and P-51s put on an intensified campaign against shipping, the biggest Operation Strangle in history. They also began neutralizing Formosa for the Okinawa campaign. The 13th (the jungle air force, based on Morotai after Sept. 1944) took care of all points south and continued important strikes (with the 5th) against the oil centre of Balikpapan, coming up into the Philippines when units of the 5th went on to Okinawa. In the Central Pacific the final arch in the bridge was put in place with the capture of Iwo Jima in late Feb. 1945. This converted what had been a warning station and interception point against the increasingly heavy B-29 attacks from the Marianas into an emergency base and refuelling centre for returning B-29s in distress. Iwo Jima also became a forward base for 7th fighter command P-51D and later long-range P-47N fighter sweeps over Japan, also carried out effectively by navy and marine carrier fighter units. Iwo saw the first large-scale use of the radar GCA (ground controlled approach) talk-down system, in which scores of B-29s, P-61 Black Widows and marine F7F night fighters and other types were landed in all sorts of weather. In May the 7th air force moved from the Marianas to Okinawa, becoming part of far eastern air forces, under Gen. Kenney, who was shortly afterward named tactical air force commander for the entire theatre, with Gen. Spaatz as the strategic air force commander.



Radio-controlled U.S. navy plane being directed by the pilot in its mother plane. He took over after the plane reached the air by remote ground control

The Japanese had lost an entire air force in the Solomons and New Guinea between mid-1942 and mid-1944, and another one in the Philippines. Aggregate losses during the course of the war were something like 50,000 planes, of which 20,000 (40%) were combat losses; the rest were training, ferrying and other noncombat losses. A Tokyo diet report revealed that aircraft production during the first nine months of the war averaged between 600 and 700 per month; about 1,400 per month during 1943; 2,300 per month in 1944; with a peak of 2,857 in June 1944. After an earthquake in the Takai area and the low-level mass incendiary B-29 missions in March 1945, production began falling off sharply, dropping to 1,003 in July. During 1943 and 1944 technical improvements were increasingly apparent, especially in engines, armament and general ruggedness of aircraft. The new types began to be encountered in limited numbers during and after the critical campaigns to seize the Marianas, Philippines and islands in the inner empire, but even then the bulk of the 1,500 to 2,000 planes per month destroyed by U.S. air forces were simply improved versions of the standard models. Most important of the group using souped-up versions of the 14-cylinder engines were Jack 11 (Raiden or Thunderbolt), first Japanese 400-m.p.h. fighter, Judy (Susei or

Comet) scout bomber, Jill torpedo bomber, Dinah 3, fast long-range reconnaissance plane, and Irving (Gekko or Moonbeam) night fighter. The latest models of all were powered by the powerful, compact 18-cylinder Nakajima Homare engine of 1,800 h.p., 2,000 h.p. with water-methanol injection. In the 400–425 m.p.h. class were the navy fighters George, Sam and Luke and the army fighter Frank; Frances (Ginka or Milky Way) and Grace were among the fastest bombers in the world (350 m.p.h.).

After the overwhelming defeat of the Japanese air forces in the Philippines, however, there was only one recourse left—a Kamikaze (Divine Wind) or suicide air force, for which preparations had been begun after the defeat in New Guinea. This capitalized on the only asset the Japanese still possessed, the willingness of their pilots to meet certain death. In the Philippines the suicide tactics were on an individual scale, but in the Okinawa campaign the mass Kamikaze attacks posed a highly critical threat, 42 U.S. ships being sunk and 216 damaged. In all some 2,550 suicide missions were flown, including those in Baka, the Kamikaze glider-bomb, 475 or 18.6% being effective. The Japanese air forces, at the time of the surrender, included 5,000 tactical planes, plus 5,400 Kamikaze planes.

The Allied strategic plan contemplated that the actual defeat of Japan would be accomplished by operations in the Pacific, but in the meantime it was essential to defend

India and to assist China. The main contribution was air and logistic support. Probably more than any other, China-Burma-India was an air theatre. The royal air force and U.S. 10th air force in India and the 14th in China had a great variety of duties. The Allied air achievements in Burma made it possible for Allied troops to exist in the jungle by supplying, evacuating and transporting them on an unprecedented scale, and by making the Japanese position untenable, through starvation and destruction of supply bases. The latter disappeared in a welter of bombed bridges, river boats, railroad trackage and freight junctions. In China it achieved command of the skies over Chinese troops, provided much of the fire power even in ground operations, and tore gaping holes in the Japanese supply routes on land and sea. Between India and China it flew the Hump of the 14,000 to 18,000-foot passes through the southern Himalayas in the greatest sustained transportation achievement of the war. Despite atrocious weather and highly dangerous flying conditions, far more military cargo was transported over the "aerial Burma road" than had been carried over the tortuous road itself, with the India-China wing of the air transport command attaining a peak of 71,000 tons in June 1945.

The R.A.F. in India was under the command of Air Chief Marshal Sir Richard Peirse, who became air commander for the theatre under Admiral Lord Louis Mountbatten when the southeast Asia command was organized at the end of 1943. Air operations were under Maj. Gen. George E. Stratemeyer, commanding general of the eastern air command, made up of a strategic air force (U.S. 10th and R.A.F. units) and tactical air force (R.A.F. and AAF units), plus a photo wing, troop carrier wing and Col. Philip Cochran's air commandos. The 10th had been commanded by Generals Lewis Brereton, Clayton Bissell and Howard C. Davidson. Equipment in India-Burma included R.A.F. Hurricane fighter bombers, Blenheim mediums, lend-lease Vengeance dive bombers, AAF P-40s, B-25s, B-24s, and A-36s (dive bomber, rocket-firing P-51s).

In China Gen. Claire Chennault had successive command of the American volunteer group, China air task force and from March 1943 the U.S. 14th air force, to which was attached U.S.-trained Chinese pilots flying P-40s and B-25s in the Chinese-American composite wing. The 14th made up for its tiny size and constant logistic limitations by masterly tactics, strategy and deception. Up to May 19, 1943, when a group of B-24s arrived, the only equipment was a handful of P-40s and B-25s. From the autumn of 1943 a few of the B-24s equipped with LAB radar (low altitude bombing device) were highly successful in sinking Japanese shipping in the south China sea. More than 2,350 Japanese aircraft were destroyed in China, including the army fighters Oscar, and later Tojo, which were almost wholly confined to this theatre. By early 1943 the Allied air forces had aerial superiority in the entire China-Burma-India theatre, and they never lost it.

During all this time the most destructive form of warfare ever waged on land, sea or in the air was being prepared—VLR (very long range) air power in the form of the Boeing B-29 Superfortress and the 20th (global) air force. Designed in 1940, flight-tested over Seattle, Wash., by Boeing's chief test pilot Eddie Allen in Sept. 1942, the XB-29 was the biggest, fastest, most complex aeroplane ever conceived up to that time. It had a 141 ft. span, was 99 ft. long, was able to fly a 16-hr. mission, was powered by four Wright 2,200-h.p. engines, had a 20,000-lb. bomb capacity, 135,000-lb. maximum overload in bombs and gasoline, a speed of 350 m.p.h. and a range of 3,000 mi. It had central station fire control in remote turrets, and an amazing array of radar and electronic equipment.

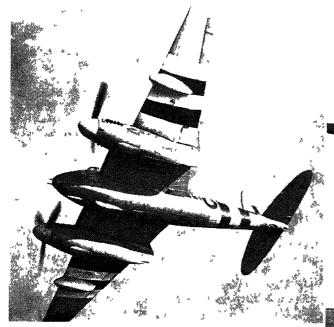
Besides Boeing (three plants), Bell (Marietta, O.) and Martin (Omaha, Neb.) were brought into the production picture, with many hundreds of subcontractors. The 2nd air force, Colorado Springs, Colo. took over the complex training program, starting with the 58th wing V.H B. (very heavy bombardment) of the 20th bomber command. The 20th air force was at H.Q. AAF, Washington, under the jurisdiction of the joint chiefs of staff, with Gen. Henry H Arnold as their executive and Brig. Gen. Hayward S. Hansell as his deputy and commanding general of the 20th.

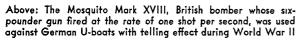
The Marianas had been selected as the operational base best adapted to knock Japan quickly out of the war, but the B-29 was ready before the big bases on Guam, Saipan and Tinian could be prepared. Hence the 58th wing (20th bomber command, under Brig. Gen. K. B. Wolfe) went to India in April 1944, and set up forward bases in the Chengtu area, China, for refuelling and take-off for bombing key targets in Japan, Manchuria, Formosa, etc. The first mission was on June 15, 1944; 75 B-29s attacked the steel works at Yawata (Kyushu), 47 reaching the target. Fifteen missions were run between then and Nov. 21. In September Maj. Gen. Curtis E. LeMay was switched to the 20th bomber command after a brilliant record with the 8th air force (United Kingdom).

By mid-Sept. 1944, Gen. Hansell, now commanding general of the 21st bomber command, arrived in the Marianas in a B-29, followed by the 73rd wing V.H.B. On Nov. 24 the first mission against Japan was run, with 80 B-29s led by Brig. Gen. Emmett O'Donnell flying 1,500 mi. along a line of Japanese-held islands to smash the Musashima aircraft factory, Tokyo. Despite treacherous weather with terrific winds, Japanese fighters and anti-aircraft opposition, 15 missions were run up to Jan. 26. On that date Gen. LeMay moved from the 20th bomber command in India to take command of the 21st on Guam, Gen. Hansell returning to the U.S. to train additional V H.B. wings, including the 315th equipped with the super-precision Eagle radar bombsight. Brig. Gen. Lauris Norstad was now commanding general of the 20th air force in Washington.

Brig. Gen. Roger Ramey took over B-29 operations in the China-Burma-India theatre, and between Nov. 1944 and April 1945 carried out some 30 bombing attacks on widely scattered strategic targets, including Rangoon, Bangkok, Formosa, Singapore, etc. In April the planes and crews of the 20th bomber command moved to new airfields on Tinian, adding its strength and experience to the 21st. In July these units switched to Okinawa to form the nucleus of the transplanted 8th air force, under Lt. Gen. Jimmy Doolittle, which however, owing to the sudden ending of hostilities, never saw combat action.

During Feb. 1945 Gen. LeMay increased his striking force from 100 to 200 Superforts, dropping 600 tons of bombs. Losses were still fairly high and bombing results not too good. In March he made a courageous decision which speeded the defeat of Japan, although it appeared to run counter to established U.S. strategic bombardment doctrine. This was to send larger formations, on night missions, armed with incendiaries, at 5,000 to 8,000 ft., permitting less gasoline and more bombs, without armament, without fighter escort, relying on darkness and speed for safety and radar for navigation and general bombing accuracy, with entire cities as targets. It worked. Tokyo, Osaka, Kobe, Nagoya, with their thousands of home industrial setups as well as large factories were fire-blitzed





Upper right: The Mosquito Mark XVI, British light night bomber designed to operate at altitudes of better than 30,000 ft. The plane was also used for photographic reconnaissance

Right: The Lancaster III, used by the R.A.F. bomber command for the major part of its tonnage dropped during World War II

Below: The Hawker Hurricane II, British fighter plane which functioned as a major weapon of the R.A.F. during operations over France early in 1940 and in the battle of Britain

Lower right: The Supermarine Spitfire XIV, British interceptor plane with a maximum speed of 448 m.p.h.







within ten days, and 32 square miles of Japan's four most important cities were burned out.

During the next five months nearly a score of cities received increasingly heavy blows as new V.H.B. wings joined the newly organized U.S.A.S.T.A.F. (U.S. army strategic air forces in the Pacific) under Gen. Carl Spaatz, including the 20th in the Marianas, now under Gen. Twining, and the 8th on Okinawa, LeMay becoming Spaatz' chief of staff. Losses of B-29s became extremely light as raids increased to 600-plane missions in July. Superfort tonnage rose from about 13,500 tons in March to more than 42,500 tons in July, with more than 25,000 tons on 14 cities during the first two weeks of August. Then on Aug. 6 and 9, in single-plane missions, atomic bombs were dropped on Hiroshima and Nagasaki, hastening a surrender which, wholly apart from the atomic bombs, would have become necessary very shortly as complete collapse was imminent, according to the testimony of Japan's top military and naval leaders. Thus, without invasion, by a tight blockade by sea and air power, and the destruction of more than 60 Japanese cities in five months by very long range air power, the victory was won.

Planes that Missed the War.-When Allied technical intelligence teams arrived in Germany in the late spring of 1945, they found such a wealth of technical information that the records ran well into the hundreds of tons. Much of this information was the result of heavy German investment in aeronautical research during the mid-30s, including rockets, jet propulsion and supersonic speed wind tunnels. Several hundred projects in various stages of development were found (including 138 various types of guided missiles), some of which were practically ready for large scale production in underground factories. Conventionally powered aircraft included the Blohm & Voss Bv-155B high altitude fighter, Focke-Wulf Ta-152 day and night fighter, the Dornier Do-335 front and rear propelled fighter and the Ju-388 high altitude day fighter, night fighter, fast bomber and reconnaissance plane. Jet fighters included the 590-m.p.h. EF-128, Focke Wulf 183 and others, while jet bombers appeared in great variety, including the Ju-287 with two, four and six units and sweptforward wings, the Arado 234 with two or four units and the Horten flying wing. Blohm & Voss and Focke-Wulf had composite-engine bombers, each powered by two Daimler-Benz inverted-V piston engines and two Heinkel-Hirth O11 turbojets. Rocket planes included the Me-263 (163 saw service) and Me-328, and rocket-powered guided missiles were far too numerous to mention, Bp-20 Natter (Viper) with its climb to 37,000 ft. being particularly deadly.

Britain's crop of bombers and fighters just on the edge of operational service at V-J day was impressive. Big four-engine bombers included the Avro Lincoln and Vickers-Armstrong Windsor, successors of the Lancaster and Wellington. The Bristol Brigand was a twin-engine multipurpose fighter-bomber (successor of the versatile Beaufighter), and the Fairey Spearfish and Blackburn Firebrand were new naval dive-torpedo bombers. Jet fighters included the De Havilland Vampire, with Goblin turbojet, fast and easy to fly. Piston engine fighters in the 450–480 m.p.h. class included the Spitfire 24 and related Spiteful, Seafire and Seafang, De Havilland Hornet and Hawker Fury (485 m.p.h. with methanol-water injection).

The U.S. army air force's 490-m.p.h. lightweight Mustang, P-51H, was in the theatre but was not used operationally, which was also true of U.S. navy Ryan FR-1

Fireball jet-cum-propeller carrier fighter. A P-80 jet fighter unit was about to go. The P-82 Twin Mustang long range fighter and Northrop F-15 photo reconnaissance plane were both almost ready for action. Important navy models which had flown but were not operational included Goodyear F2G Corsair with Wasp Major engine, Lockheed P2V Neptune (of which the record-breaking "Truculent Turtle" was the most famous at the end of the decade), McDonnell XFD-1 Phantom jet fighter, Martin BTM Mauler, Douglas AD-1 Skyraider and Curtiss BT2C dive and torpedo bombers. The army air force's 1946 crop included Convair's propjet-turbojet powered XP-81, twin-jet bomber Douglas XB-43, Republic XP-84 Thunderjet, Northrop XB-35 flying wing and Convair six-engine XB-36.

The U.S.S.R. had a couple of advanced YAK fighters ready for action, and after the end of the war British sources reported one or two jet fighters in the 600-m.p.h. class, powered by jet units well advanced in Germany at the end of the European fighting and completed by German technicians in the Russian zone. A U.S. source reported a Russian jet fighter with two units, one on each side of the fuselage, as in the Bell P-59.

Postwar Trends.—Results achieved by Allied air power in the war in Europe and in the Pacific, together with signposts as guidance to the future were found in the conclusions of the reports of the United States Strategic Bombing survey, a distinguished group of 300 civilians, 350 officers and 500 enlisted men activated in Nov. 1944 by the secretary of war:

Allied air power was decisive in the war in western Europe . . . In the air its victory was complete; at sea, its contribution, combined with naval power, brought an end to the enemy's greatest naval threat—the U-boat; on land, it helped turn the tide overwhelmingly in favor of Allied ground forces. Its power and superiority made possible the success of the invasion. It brought the economy which sustained the enemy's armed forces to virtual collapse . . . It brought home to the German people the full impact of modern war with all its horror and suffering. . . .

The experience of the Pacific war supports the findings of the Survey in Europe that heavy, sustained and accurate attack against carefully selected targets is required to produce decisive results when attacking an enemy's sustaining resources. It further supports the findings in Germany that no nation can long survive the free exploitation of air weapons over its homeland . . . Science has increased tremendously the destructive capability of modern weapons and promises further developments in the future. It is not generally realized the degree to which basic scientific research was neglected in the United States during the course of the war in order to concentrate on the belated development of the specific weapons immediately required, nor the degree to which we lagged behind Germany in advanced aerodynamics, jet propulsion and the development of guided missiles. In air armament and torpedoes, even the Japanese were ahead of us . . . This type of work has become so complex that expenditures for research and development in the order of 1,000,000,000 dollars annually may be required to assure an acceptable degree of national security. .

Within a department of common defense which provides unity of command and is itself oriented toward air and new weapons, the Survey believes that in addition to the Army and the Navy, there should be an equal and coordinate position for a third establishment. To this establishment should be given primary responsibility for passive and active defense against long range attack on our cities, industries and other sustaining resources; for strategic attack, whether by airplane or guided missile; and for all air units other than carrier air and such land-based air units as can be more effective as component parts of the Army or Navy.

Under the over-all direction of the AAF Scientific Advisory board, composed of outstanding scientists, the U.S. army air forces undertook a comprehensive program in cooperation with government and university research organizations and scientific and engineering groups of the aircraft industry, including the following fields: (1) super-

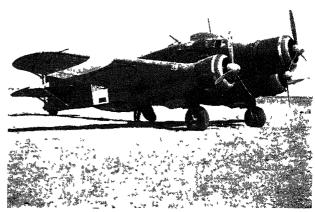
sonic aircraft, piloted (such as the Bell XS-1) and pilotless (such as Boeing GAPA—ground to air pilotless aircraft); and winged missiles having velocities approaching the meteoric; (2) nuclear energy applications for propulsion of aircraft and missiles; (3) flight and survival equipment for use above the atmosphere, including space vehicles and devices for use therein; (4) aircraft and missile operating technique development. Under the technical guidance of the Applied Physics laboratory, Johns Hopkins university, Baltimore, Md., the U.S. navy adopted a similar program, possibly of even broader scope. By autumn of 1946 the National Advisory Committee for Aeronautics had no less than 11 wind tunnels engaged in research in supersonic speeds for piloted and pilotless aircraft and guided missiles.

Similar developments were under way in Great Britain, where a £20,000,000 National Aeronautical establishment was planned, with the proposed National Gas Turbine establishment and the National Aeronautical college close by. Great emphasis was being laid on jet propulsion, rockets and guided missiles, in addition to a new program of rocket research stations and testing ranges in Australia. The U.S.S.R. reported that nuclear energy, radio location and jet propulsion were among the major problems for soviet scientists.

Such developments indicated clearly that the piloted aeroplane as a striking weapon was on the way out, but it was also certain that the new superweapons were still years away as far as operational use was concerned. Military and naval planning staffs were thus having to work with material available. The U.S. army and navy air forces were rapidly going over to jet-powered fighters, as were the British, with Canada, Australia, Sweden and Switzerland (among others) equipping their air forces with British jet aircraft and turbo-jet engines. The soviets were undergoing a similar transition. Jet bombers were also well on the way. The Military committee of the United Nations was working constantly toward the goal of a readily available, powerful international air striking force for the prevention of wars. (N. F. S.)

Strategic Role of the U.S. A.A.F.—Japan, after watching Germany's rapid movements in the early years of World War II, came to the conclusion that its naval aviation could deliver a death blow to the U.S. navy anchored in Pearl Harbor. Then, without opposition in the Pacific, a line of outposts could be established that would prevent any attacks being made on Japan proper. The Japanese armed forces would be supreme in the Pacific. Those outposts would be so remote that attacks on the homeland would be impossible, either by air or by surface forces. Under those circumstances a compromise peace would be the worst condition that Japan would have to meet.

Air power certainly lived up to the expectations of the Japanese leaders, as a striking force, when it destroyed the U.S. fleet in Pearl Harbor; but the Japanese strategists guessed wrong in so far as the balance of the plan was concerned. They could not conceive of the United States building up an army, navy and an air force as rapidly as it did. Almost before the smoke had cleared away from the debris in Pearl Harbor, the co-ordinated advance of the army, navy and air force started across the Pacific. As the Japanese were pressed back, its fleet and its air force were destroyed, bases were secured for operations of the U.S. army air force, and attacks were made on the Japanese homeland. These aerial attacks destroyed Japanese industrial and transportation facilities; made it impossible for critical materials to be received in Japanese ports; undermined Japanese morale, destroyed its will to fight and



Savoia-Marchetti S-79, Italian torpedo bomber, parked at a .U.S. air base in Sicily

brought about the end of the war. The war ended with some 4,000,000 well-trained, well-equipped, undefeated Japanese soldiers waiting for U.S. troops to make a landing. Such were the paths that the power of the air outlined for world events to follow; such was the place in history that aviation carved for itself during World War II.

One of the cardinal principles as taught by the U.S. army air force for many years was: "Strategic bombing, properly carried out, can destroy the sinews of war; can wreck transportation systems; can prevent the flow of materials and personnel to operating armed forces; can deprive the fighting forces of the wherewithal with which to continue battle, and thus can bring an end to the war." That principle was not accepted by the German leaders, who, by 1942, were convinced that fighting planes and ground defenses could make daylight bombing so expensive in planes and trained crews, that bombing to complete destruction was impossible. In this, Germany was supported by many British leaders. They had Germany's attacks on English targets, and the R.A.F. attacks on German targets -neither operation a success for daylight bombing-as criteria for their position. Neither the Germans nor the British, however, took into consideration the great initiative of the U.S. airmen, the rugged U.S. air equipment and the technique of operations of the U.S. army air force.

The U.S. certainly found the going tough on its daylight raids; but it kept on going, in spite of losses. The German opposition became less and less. U.S. army air force units were soon able to make shuttle bombing runs, taking off from England or Italy, flying all the way across Germany and landing in the U.S.S.R. The U.S. airmen met the German air force on its home grounds, they destroyed industry after industry, demolished railroads and depots, canals and warehouses, and soon made the German air force impotent. The heart was taken from the German fighting machine, and it soon collapsed. This, however, did not happen until the German scientists had brought out many new devices, gadgets and weapons, such as the V-1, a pilotless plane, and the V-2, the rocket that caused much consternation among Allied personnel. Actually, these new devices were far more of an irritation than a danger; but had the Germans been allowed to develop them into articles of production, they might well have caused considerable confusion among the Allied commanders. They did give definite indications as to the weapons of the future, however.

Prior to 1940 the U.S. army air force was practically a paper organization. It had few planes, no industry to

speak of when quantity production was desired and a limited number of pilots. Its operating technique had never been tested. When Pres. Roosevelt approved a program in 1939 pointing toward the defeat of Germany and Japan through the air, all phases of air power for the United States were given a definite start. The principle was then accepted for the first time that mere aeroplanes, no matter what the numbers, could never make an air force, nor give a nation air power. For any nation to have an air force there must be an air industry, a flexible training system, that could be expanded rapidly, for pilots and for all other personnel, depots for supplies and for reserve personnel, air bases from which the planes could operate, radio, navigational, weather and other equipment to give service to the planes over the airways and at the bases.

The war clouds in Europe at the start of World War II gave the U.S. air industry a very healthy growth because of the planes ordered. At that time the U.S. aeroplane strength in the army air force was about 1,800 combat planes. The first real push toward air power came with the fall of Paris. Congress then changed its ideas from: "Whom are you going to fight?" to: "What do you need?"; "How much money do you need?"; and, "What is holding you back?" Funds were no longer a bottleneck. The aircraft industry built up rapidly from a total of about 3,000 planes a year in 1939, until a production of about 7,000 a month was reached in 1944. Pilot production paralleled plane production: 700 a year in 1938, to 103,000 a year in 1944.

The U.S. army air force very fortunately had some tried and true planes when Japan struck in Dec. 1941. These planes coming off production lines in fairly large numbers, made it possible for MacArthur to hold back the Japanese air force when his back was against the wall in New Guinea. These old planes flew from a carrier to the bulge of Africa and then across the jungles and deserts of central Africa, to take their places alongside the R.A.F. in Egypt, where they played a magnificent part in driving Rommel back to Tunisia. They were used to train some 500,000 crew members who fought in the air in all parts of the world.

These prewar models—the P-38s, 39s and 40s, the B-25s, 26s, the A-20s, the B-17s and 24s and the C-46s and 47s—all did well until they were superseded by later models. They were re-equipped, remodeled and redesigned, but they held the line in the air until the P-47s and 51s, the A-26s, the B-29s and the C-54s came along to take their places (see above). U.S. designers did not stop their drawing board work. New types of planes were constantly being tested: the latest models never stopped coming out of the engineering sheds at plants all during the war. Had the war lasted another year, U.S. jet planes, P-59 and P-80, the large bombers, B-35 and B-36, the most modern and best performing yet produced, would have been in combat.

In the early days of World War II, with German submarines picketing the sea lanes of the Atlantic, and the Japanese holding islands all over the Pacific, air transport service became most important. Vital supplies and critical items, as well as important people, had to reach their destinations in the shortest possible time. The U.S. army air transport command carried almost anything, anywhere in the world—over the Pacific and the Atlantic; in Europe, in Asia and in Africa; for the island fighting leading up to Japan itself. The air transport service proved itself a necessity to the land, sea and air forces. These world-

wide operations of the transport command, and the ferrying of combat planes to their bases in the combat zones, gave invaluable experience for peacetime commercial flying.

The problem of supplying the Chinese to keep them alive as an active combatant nation was one of the most important operations. China was cut off from its Allies by a Japanese-occupied coast line, by a neutral Russia and by that almost impassable barrier, the southern spur of the Himalaya mountains. Crossing northern Burma by road was impossible, as the Japanese had possession of the critical points along the road. These facts, coupled with the difficult weather for flying across Burma, and the exceedingly rough terrain, gave the Japanese confidence that air transportation of supplies into China was not practical. With such a challenge, it was not long before the air transport command started flying across the Hump. As the personnel attained more experience, and the number of planes increased, the tonnage carried built up, and China was kept in the war. The going was rugged when the run started, and the tonnage taken into China rarely exceeded 2,000 tons a month. Then it rose to 4,000 and 8,000; and the Chinese armies took on new hope. Months passed, and the tonnage increased to 16,000; to 20,000 and the Chinese armies started fighting back at the Japanese. By July 1945 the monthly tonnage had reached a figure of 70,000 tons-a tonnage about four times the maximum amount ever taken over the Burma road, and there were no more fears of China's being forced, by lack of supplies, to make a separate peace.

During the decade 1937–46, the air forces of the world changed war-making, created new techniques for destroying enemy vital points and outlined new paths for the future, for peace or war. Military flying across oceans took the mystery out of transoceanic navigation, proved that flights across the North Atlantic need be no more dangerous in winter than in summer, established bases, communications systems, around the world and made transoceanic flights routine. New navigation instruments, radar, de-icing devices, more reliable engines, modern transport planes and a better knowledge of flying conditions all over the world comprised the heritage that military aviation left to commercial carriers.

The decade saw military bombing advance from the feeble attempts of the B-10 trying to hit a target, to B-29s, operating in large masses, completely destroying large cities on a single mission. It saw air power built up from old bombers struggling to carry a 2,000-pound bomb 1,000 miles, to those carrying 7 tons of bombs to targets 1,600 miles away, and were still able to return to their bases; it saw the speed of fighters increase from 300 m.p.h. to more than 500 m.p.h.

New devices made it possible for bombers to fly equally well by night and by day, through all kinds of weather; made it possible for them to hit targets with practically the same precision in the clear, or when hidden by clouds and rain. The atomic bomb made its appearance, and, carried on a single plane, destroyed practically an entire city. New planes made their appearance—planes that could fly distances of more than 8,000 miles. New developments of rockets, manless planes, radar, remote control of flying planes, warheads that "home" on heat, light, sound and metal, were just around the corner; and man's imagination was strained with the thought of world-circling aerial giants in the offing. (H. H. A.)

U.S. Naval Aviation.—From its inception United States naval aviation included air components of the navy and marine corps. From Nov. 1941 to Jan. 1946, the coast

guard, including its aircraft units, operated under naval control. Liaison with the U.S. army air forces and with civilian agencies was maintained through membership on joint boards and committees.

Changes in organization between 1937 and 1946 were the result of the growing importance of air power in naval warfare. Under the chief of naval operations, a deputy chief of naval operations (air) was established in Aug. 1943 to handle questions of logistical and personnel planning for aviation and its co-ordination with other naval activities. The bureau of aeronautics continued to function as a material organization, charged with the design, development and procurement of aircraft and aviation material and with questions of maintenance and supply. On the highest departmental level was the assistant secretary of the navy for air.

Within the fleets air units were assigned to task forces for operations. For training, logistics, material and routine administration they came under type commands. In 1937, there existed a differentiation between carrier and patrol planes. Under war conditions, however, this proved confusing, and on Sept. 1, 1942, a single command for logistical support and administration was established in the Pacific fleet. The Atlantic fleet adopted a similar organization on Jan. 1, 1943. This system combined administrative centralization and stability with flexibility in operations.

Since marine aviation was an integral part of the naval aeronautical organization, its director was a subordinate of the deputy chief of naval operations (air), as well as of the commandant of the marine corps. Subordinate marine commanders reported to corresponding naval air commands for logistic and material activities, and marine units were assigned to task forces as their availability and the operating situation required.

The basic unit in all naval aviation continued to be the squadron. In 1937 patrol-plane squadrons with their tenders were organized in patrol wings, redesignated fleet air wings on Nov. 1, 1942, so as to include all navy landand tender-based aircraft, except lighter-than-air. In 1938 the navy created carrier air groups to include two or more squadrons operating from a single ship. The marine corps adopted a wing organization in 1941, each wing composed of two or more groups, and a group made up of two or more squadrons.

Beginning in 1934 as international relations began to deteriorate, the navy grew and aviation expanded even more rapidly than other parts of the naval establishment. Table I indicates the number of planes authorized at various dates either by legislation or executive order.

Table I.—Number of Planes Authorized (1934–44)

Date of Legislation or Executive Order	No. of Planes Authorized						
	Treaty Navy (estimated about 2,000 planes)						
May 17, 1938	"Not less than 3,000"						
June 14, 1940	4,500						
June 15, 1940	10,000						
July 19, 1940	15,000						
January 14, 1942	27,5 00						
June 15, 1943							
February 2, 1944							

In the state of the aircraft industry in 1946, authority to build a plane was no guarantee that it would be delivered within a short time, and the rate of expansion is better indicated by Tables II and III, the first of which gives the number of planes and pilots available on July 1 of each year, and the second of which traces the rise of the carrier force by calendar year.

The increasing number of planes and fliers was accompanied by the addition of ground personnel to main-

				ap	16	н.		YU!	TI D	er	OI	r	an	es	un	Q	rıı	OI:	5 /	(Va	Idble (1737-43)	
Date																					Service Aircraft on Hand	Pilots on Active Duty
1937																					1,037	1,952
1938																				٠	1,564	2,381
1939																٠					1,679	2,734
1940																					1.730	3,069
1941			-	-																	3,406	4,544
1942	:	:	:	:	:	:	:														7,195	11,360
1943																					16.834	26,543
1944				i																	33.707	48,019
1945														÷							40,893	59,333

Table III.-Growth of Carrier Force (1937-45)

								Medium Carriers*		Carrier	
Date								(over 14,000 tons)	(10,000 tons)	Escorts	
1937								4			
1938								5			
1939					-		٠	5			
1940						٠		6		_	
1941								7		_1	
1942								4		12	
1943								13	9	35	
1944								20	8	65	
1945			_			_	_	23	8	72	

*Large carriers, 45,000 tons, were nearing completion when World War II ended.

tain and service the aircraft and to carry on administrative duties. The navy also bought, leased and built numerous facilities for training and support within the United States and began an advanced base program in both the Atlantic and Pacific. In the former area the transfer of destroyers to Great Britain in return for leases in the West Indies and the additional sites granted without compensation in Newfoundland and Bermuda permitted the construction of air stations which greatly increased the area brought under naval air surveillance.

Aircraft and Equipment.—Navy carrier planes were not simply standard military aircraft modified for carrier work, but were especially designed to meet the requirements of carrier operations. The bureau of aeronautics, working in close co-operation with research institutes and manufacturers, succeeded in designing and having built the finest carrier aircraft in the world, capable of meeting not only enemy ship-based but also all land-based planes encountered. On the basis of experience three typesfighters, scout or dive bombers and torpedo planes-were developed. The growth of the U.S. navy, the greater appropriations available from 1934 and advances in aeronautical science permitted the development of new models.. When war broke out in Dec. 1941, the basic designs had been drawn, and many new types either were being received in the fleet or were already in production. With modifications based on lessons learned in combat these basic models continued to be employed throughout the war period, and it was not until after the conclusion of hostilities that new types, designed during the conflict, became available. Table IV shows the carrier aircraft most widely used, the navy designation for each and the year in which it became operational.

Table IV.—Type Designations of Carrier Aircraft

Туре										Designation	Year
Fighters Wildcat Hellcat Corsair				٠						. F6F	1941 1943 1943
Scout Bombers Dauntless										, ,	1941 1943
Torpedo Plane										TRF TRM	1942

Patrol planes made up a second category. Prior to Oct. 1941, the navy used flying boats exclusively for this sort of operation, having by that time the Catalina (PBY), the original model of which was delivered in 1937, and by 1945 had gone through six modifications including two am-

phibious versions; the Mariner (PBM), a two-engined plane, heavier, faster and with greater range than the Catalina; and the Coronado, (PB2Y) a four-motored flying boat used in antisubmarine warfare and, during the early part of the war, for transport rather than combat. Experience with the neutrality patrol between 1939 and 1941 showed that land planes were better suited to winter operation in northern latitudes, and in the autumn of 1941 the navy acquired 20 Hudson (PBO) bombers. From this plane descended the Ventura (PV-1) and the Harpoon (PV-2), employed in antisubmarine and antishipping attacks and in operations from the Aleutians. The first months of the war also demonstrated that a more easily defended and longer-ranged type was needed in areas where strong enemy opposition could be expected. Late in 1942 the navy obtained its first Liberators (army B-24s, which were redesignated PB4Ys) and which after extensive interior modification were used for search, reconnaissance and photographic work. A later version of this plane with a single fin and other changes to adapt it to naval requirements was given the more nautical name of Privateer (PB4Y-2). The marines employed another army model, the Mitchell (B-25, called by the Navy a PBJ).

Small single-engined seaplanes were developed for catapulting from battleships and cruisers. Standard military and civilian types were commonly employed in training and air transport. An exception was the giant Mars (JRM-1), a 70-ton flying boat, which was especially designed and produced for the navy.

The U.S. navy alone made large scale employment of lighter-than-air craft. Especially adapted to antisubmarine patrols, convoy escort and utility work, the blimps increased from a small force of 12 in Dec. 1941 to 135 capable of over-water operation in 1945.

Besides aircraft, the navy also developed instruments, equipment and ordnance. In many items standardization was achieved with the army and with Allied Powers. Machine guns, bomb types, radar and much electronic equipment were used by all. Among the contributions of the navy to the common stock were the Norden bomb sight, widely-used types of aircraft rockets, improved aerial torpedoes, and guided missiles. Some items such as sonobuoys and magnetic airborne detection gear, both employed in antisubmarine warfare, were not used by other services. The position of naval aviation made it possible to design plane types and equipment to meet the special problems of naval warfare. When items of use to other services were developed, continuous exchange of technical information made them rapidly available to all.

Training.-With a growing number of planes, training presented continuous problems of personnel, facilities and methods. Beginning with the Aviation Cadet act of 1935, congress provided for induction of large numbers of reserve officers. Because the cadets were brought into the service directly from civil life, they required instruction not only in the art of flying but also in naval subjects. Specialization was necessarily introduced and, instead of the naval aviator being drawn from the fleet and trained in all types of naval aircraft, there appeared large numbers of reserve officers qualified to fly only one type of aircraft and with a restricted knowledge of naval lore necessary to an understanding of their role in sea warfare. To relieve pilots of administrative and technical duties civilian specialists were commissioned as ground officers. In 1937, the navy possessed a single training establishment at Pensacola, Fla. By 1941 the two big bases at Corpus

Christi, Texas, and Jacksonville, Fla., had begun operation, and additional facilities were being constructed or leased in the interior of the country. To save on planes and to permit training to continue regardless of weather the navy adopted and, in thousands of instances, itself developed special training devices.

The leadership of the United States in naval aviation was recognized by its allies, and thousands of British, French and Latin-American pilots were given the navy's course of instruction.

Two years of war in Europe meant intensive preparation in the United States. Although the readiness of naval aviation was far from ideal, great strides had been made, planes had been designed and put in production, and the training program had rapidly expanded.

Wartime Functions.—Official policy indicated as a primary function of the U.S. navy, the control of the sea in defense of the nation and its interests. As an integral part of the naval forces, aviation contributed to this end in co-operation with surface vessels, submarines and marine ground troops.

Before World War II the role of aircraft in naval warfare was studied in the annual fleet exercises. Although the number of carriers and squadrons was small compared with later standards, on the basis of these annual manoeuvres the operating methods, tactics and military characteristics of aircraft were established, with such success that the plane types designed between 1935 and 1941 remained in use throughout the war.

Although the United States was not engaged in hostilities until Dec. 7, 1941, the navy went into action on Sept. 6, 1939, a week after the German invasion of Poland. It patrolled coastal approaches and sought to prevent the conflict from spreading to the western hemisphere. With the fall of France in the spring of 1940 and the acquisition of bases from the British in the autumn of the same year the tempo of the patrol increased and the search areas of naval aircraft were extended. In the spring of 1941 the passage of the Lend-Lease act virtually committed the U.S. navy to provide for the safety of convoys in coastal waters and for a considerable distance into the mid-Atlantic. By Dec. 1941, naval patrol planes were operating from Iceland, Newfoundland, Bermuda and the north coast of South America.

In the Atlantic theatre the navy had for its principal task the protection and maintenance of supply lines. Although carrier planes supported the landings in North Africa in Nov. 1942, and on the coast of southern France in Aug. 1944, the concentration of effort was against submarines which were threatening the convoys to England, North Africa and later the continent. Air participation at first was largely limited to planes operating from shore bases. Two types of patrol were maintained-an inshore patrol by light planes along the continental shelf and a widespread search pushed as far to sea as possible by big flying boats and land-based aircraft. From the beginning it was a co-operative venture in which the air forces of the United States, Great Britain, Canada, Mexico, Brazil and other belligerents participated. From Dec. 1941 until sufficient navy planes became available in the late summer of 1943, the U.S. army also assigned squadrons to antisubmarine duty to operate under naval control. From the latter date the navy assumed full responsibility for United States participation.

The best efforts of patrol aircraft, however, left an area in the mid-Atlantic free from air reconnaissance. Escort carriers converted from merchant hulls permitted the filling of this void after March 1943. Originally intended

to accompany convoys, these small carriers achieved more substantial results when operated independently as members of hunter-killer groups, composed of a single carrier and a small number of co-operating destroyers or destroyer escorts. Combined air-surface action proved the best weapon against the submarine.

Naval planes accounted for 81 German and 1 Italian submarine, about 10% of those sunk by all forces in the Atlantic. Figures, however, told only a small part of the story. Since the real objective of the navy was to get ships with men, equipment and supplies to the European theatre, the number of submarines prevented from attacking while convoys slipped past was as important as the actual kills. The increase in planes and escort carriers was accompanied by a decline in the effectiveness of axis underwater operations. In this respect aviation contributed significantly to the naval effort.

In discussing the Pacific theatre the U.S. Strategic Bombing survey remarked:

Japan's geographical situation determined that the Pacific war should in large measure be a war for control of the sea and, to insure control of the sea, for control of the air over it. As a result, attacks against warships and merchant ships and amphibious operations for possession of island positions on which forward bases could be located were close to the heart of the struggle. Carrier task forces, surface ships to provide logistic support, and submarines therefore assumed roles of unusual importance. (U.S. Strategic Bombing Survey, Summary Report [Pacific War], p. 27, 1946.)

It was primarily a naval war, because, if Allied military power were to count, it must be carried across the ocean and, before that could be done, the Japanese fleet had to be destroyed, Japanese forces driven from key island positions, Japanese supply lines disrupted, and by-passed Japanese garrisons contained. Early in the war it was discovered that ships could not safely operate unless friendly forces controlled the air. Because long over-water distances combined with the range limitations of aircraft made support by land-based air impossible in many vital areas, naval aviation was a key to victory in the Pacific.

Among numerous actions six major naval engagements could be distinguished: Battle of the Coral sea, May 5-8, 1942; Midway, June 3-6, 1942; Guadalcanal, Nov. 12-14, 1942; the Philippine sea, June 19-20, 1944; Leyte gulf, Oct. 23-26, 1944; and the East China sea, April 7, 1945. In four of these surface craft never made contact, and the entire battle was an air-surface engagement between carrier planes. In the battle of Guadalcanal land-based naval and marine aircraft played a major role; and in the battle for Leyte gulf, carrier.planes turned back two enemy forces and pursued the remnant of a third that survived a surface engagement in Surigao strait. Besides the war vessels destroyed in major actions, others were sunk in lesser encounters and in the harbours of Japan and its empire. All in all, naval and marine aircraft accounted for 48% of the Japanese combatant ships of the size of destroyer and above sunk during World War II.

A second effort was to destroy the merchant shipping through which the Japanese obtained supplies from the East Indies. Naval, including marine, air units accounted for 20.6% of this shipping, twice as much as any other agent except United States submarines. Many of the cargo vessels sunk were encountered by naval planes in the course of routine patrols from Pacific island bases. Effective night tactics against shipping worked out by radarequipped Catalinas, known as Black Cats, were employed in the South and Southwest Pacific.

Amphibious operations on a scale unprecedented in warfare were a feature of the struggle in the Pacific. In

the successful storming of Japanese beaches naval aircraft from carriers played a conspicuous part, especially in the advance of Central Pacific forces from the Gilbert Islands, Nov. 1943, to Okinawa, April-June 1945. No amphibious operation could succeed without control of the air, and where distance from Allied land bases was greater than 300 miles, necessary air cover could come only from carriers. Fast carrier forces destroyed air power in the region under attack, prevented the Japanese from bringing up reinforcements either through the air or on the surface, and, when needed, gave close support to landing troops. The last function was more particularly attributed to escort carriers that accompanied the invasion force, covered its ships and furnished antisubmarine protection as well. Marine aircraft continued the support of ground troops by operating from captured Japanese fields as soon as they were secured. In the closing months of the war marine squadrons from escort carriers furnished close air support for landings.

Japanese garrisons left on by-passed islands were prevented from harassing Allied communications by regular air attacks destined to render air fields inoperational, destroy installations and lower morale. Marine airmen were particularly active in this work, but navy and army fliers also participated.

Exact figures on the number of Japanese aircraft destroyed during the war will probably never be ascertained. The best figures available in 1946, however, indicated that naval and marine planes accounted for about three-fifths of those shot down or destroyed on the ground in all theatres, and, therefore, constituted the largest single factor in the destruction of Japanese air power.

The acquisition of bases from Great Britain in 1940 and the extension of U.S. installations in the Pacific emphasized the need for an air transport system to move high-priority cargo and personnel. On Dec. 12, 1941, the naval air transport service was established. At its greatest extent it operated over 76,000 mi. of regularly scheduled air lines, reaching from Europe to the shores of Asia and entering all theatres where the navy operated. In forward areas in South and Central Pacific, army, navy and marine corps pooled their aircraft and facilities and operated together under marine control.

Postwar Developments.—The end of hostilities in Aug. 1945 resulted in an immediate cancellation of orders for planes. The process of building the air force was reversed, planes were scrapped, personnel were demobilized, air fields were sold or returned to their civilian owners or leased, carriers were put up and the aeronautical organization in general was restored to a peacetime footing. By late 1946 demobilization was virtually terminated, and naval aviation had approximately 16,000 pilots and a similar number of planes. Of the great carrier force, between 20 and 25 were to be retained in the active fleets, three others in the reserve fleet, and 78 preserved and assigned to the inactive fleet. The naval air transport service abandoned its transatlantic routes and curtailed those in other areas, except in the far reaches of the Pacific, where some extension occurred to serve the occupation forces in China and Japan.

Not all construction was stopped at the end of the war. Carriers of a new large type, designated CVB, were placed in commission late in 1945. Aircraft squadrons were reequipped with planes embodying the lessons learned and advances made during the war. Most widely noted of the new aircraft was the Neptune (P2V), a two-engined patrol

plane that in Oct. 1946 set a record for air-line distance for any plane type when one flew from Perth, Australia, to Columbus, Ohio, a distance of more than 11,000 mi. On the basis of the war experience, the navy embarked on an extensive program of experimentation and development. Jet propulsion presented many problems, especially in adapting it to the peculiar conditions of carrier operation. On July 21, 1946, however, a navy-designed jet plane landed on, and took off from, the "Franklin D. Roosevelt." In the form of target drones for anti-aircraft practice, the navy employed pilotless aircraft during the war, and experimentally they were used in operations near the end of the conflict. After the termination of hostilities the investigation of their relation to all phases of naval warfare progressed rapidly. In electronics research went forward along many lines, much of it in close co-operation with the army, civilian agencies of government and leading research institutions.

To ensure rapid mobilization in case of national emergency a reserve program was established under which former naval and marine fliers enjoyed the opportunity to fly at regular intervals and to receive instruction in new developments and tactics. Provision also was made for training young men for the reserve so that the nation might be assured of a continuing group of qualified naval aviators available when needed. (A. W. Rd.)

(See also Airports and Flying Fields; Air Transport Command; Aviation, Civil; Civil Aeronautics Administration; Gliding; Incendiary Warfare; Munitions of War; Psychiatry; Psychology; Strategic Bombing; Tactics of World War II; World War II; see also under various countries.)

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Avila Camacho, Manuel

Avila Camacho (1897—), Mexican statesman, was born April 24, 1897, at Teziutlán in the Mexican state of Puebla. He joined the successful revolution against Victoriano Huerta in 1914, attaining the rank of a general of a division. Avila Camacho was minister of war and navy in the Rodriguez government and was secretary of national defense in the cabinet of President Lázaro Cárdenas. As Cárdenas' choice as his successor to the presidency, Avila Camacho was elected president on July 7, 1940, defeating Gen. Juan Andreu Almazán by 2,476,641 votes to 151,101. Avila Camacho was inaugurated Dec. 1, 1940.

One of his major acts was settlement of the oil expropriation controversy in 1941. In foreign affairs, Avila Camacho consistently stressed hemispheric solidarity and on May 22, 1942, three weeks after a German submarine had sunk a Mexican ship, he called for war against the axis. Congress unanimously approved his request; on June 2, 1942, he signed Mexico's declaration of war against Germany, Italy and Japan (retroactive to May

22), and Mexico joined the United Nations. Under his guidance, Mexico embarked on a program of developing war materials and supplied many vital raw materials to U.S. factories during the conflict.

Avila Camacho did not neglect cultural activities during the war, and in 1944 he signed a decree requiring every Mexican to learn to read and write by Feb. 28, 1946. Some 10,000,000 primers were printed in this sweeping effort to stamp out illiteracy. Avila Camacho stepped down as President Dec. 1, 1946, in favour of his successor, Miguel Alemán.

Avocadoes

See FRUIT.

Axis

See FASCISM; GERMANY; ITALY; JAPAN.

Azaña y Diez, Manuel

Azaña (1880-1940), Spanish statesman, was born in Alcala de los Henares in Castile on Jan. 10, 1880. He was educated at the Augustinian academy at El Escorial and began his career as a playwright and author. For 12 years he was secretary of a literary society in Madrid, during which he won fame as a critic. He was indifferent to politics until the establishment of the Spanish republic in 1931, at which time he became minister of war in the provisional cabinet. His army reforms were unpopular with the regular officers and were credited in many quarters as being a major cause for the revolt led by General Franco in 1936. When Niceto Alcala Zamora was deposed as president in 1936, Azaña was chosen to succeed him. In Nov. 1936, the insurgents' advance on Madrid caused him to flee to Barcelona, and he moved with his cabinet from place to place until it was apparent that the republican cause was lost. He then went to Paris and took refuge in the Spanish embassy. He died Nov. 4, 1940, at Montauban, France.

Azerbaijan

See Iran.

Azerbaijan S.S.R.

See Union of Soviet Socialist Republics.

Azores, The

See Portugal; Portuguese Colonial Empire.

Bacon

The output of U.S. bacon during the decade 1937-46 maintained about the usual relation to total pork production, approximately 19% of total dressed weight. The amount produced depended upon the practice followed in trimming dressed pork. Consumers in the United States and Great Britain continued to prefer a lean bacon with very little fat, while the Russians wished all the fat they could get. That part of the pork output used for lendlease shipments was cut in accord with these preferences. While the amount of bacon sliced under federal inspection indicated the general trend, it was not a wholly accurate guide to the amount produced. In 1937 this amounted to only 219,541,000 lb., while estimates based on the 19% ratio of bacon to dressed pork would indicate that total production was about 1,321,000,000 lb. The sliced product probably represented the changes in the supply available to civilians fairly accurately, however. By 1942, pork production had increased in volume about 50%, while inspected bacon output increased to 365,749,-

ooo lb. Pork production reached its peak in 1943, but inspected bacon was at the top, 549,857,000 lb. in 1944. The hogs marketed in 1944 were lighter than those sold in 1943, which accounted for the smaller output of bacon.

Production of Bacon in the United States, 1937-46

				(in po	ounds)				
1937				1,321,000,000	1942				2,037,000,000
1938					1943				
1939 1940				1,645,000,000	1944				
				1,892,000,000 1,795,000,000	1945 1946				

Supply for civilians was very scarce in 1944 and 1945. Exports of bacon and sides declined from 38,400,000 lb. in 1931 to 2,900,000 lb. in 1937 then increased to 203,400,000 lb. in 1942. Then followed a decline to about 40,000,000 lb. in 1945.

With the beginning of World War II, Canada made "bacon agreements" with Great Britain to supply that market. The agreement made in 1942 called for exports from Canada amounting to 675,000,000 lb. A considerable part of the U.S. bacon supply was required for the military forces, and a shortage of civilian supplies resulted. Government purchases declined sharply in 1945, however, allowing more of the production to go into civilian markets. By mid-1946 bacon distribution had almost reached the prewar normal. (See also Hocs; MEAT.)

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Bacteriological Warfare

See BIOLOGICAL WARFARE.

Bacteriology

An evolution of knowledge of antibiotics occurred during the decade 1937-46. Noteworthy advances in knowledge of penicillin had begun in 1936, when a group of scientists at Oxford university, England, with aid from the Rockefeller foundation and under the direction of Howard Florey, began exhaustive investigations of penicillin, which had first been observed by Alexander Fleming in 1929. Between 1937 and 1946 the methods of mass manufacture, artificial development of better types of culture variant and culture media, methods of assay and of therapeutic administration and numerous other technical details were greatly improved. While laboratory studies by thousands of workers throughout the world were proceeding, clinical trials were being made, resulting in cure after cure of hitherto highly fatal or disabling infectious diseases, including gonorrhoea and syphilis. Under the impetus of the war in Europe and the subsequent Pearl Harbor attack in 1941, and with the guidance and help of the Food and Drug administration, the U.S. Office of Scientific Research and Development and the National Research council, work on penicillin was speeded up and broadened, especially at the Northern Regional Research laboratories at Peoria, Ill. Eventually these studies led to the commercial production of penicillin on a scale so vast that whole industries sprang into being. It was not too much to say that the course of World War II and the whole attitude of modern society toward questions relative to venereal diseases, sex, promiscuity and morals were appreciably influenced within the span of two years by the production and use of penicillin for the control of war wound infections, epidemic disease and especially venereal disease.

The product was made purer and more concentrated, and in 1944 the International Conference on the Standardization of Penicillin at London agreed on standards of potency, definition of an international unit and methods

of assay. In 1944 and 1945, the efficacy of the drug appeared to diminish mysteriously, but extensive studies at Johns Hopkins university, Baltimore, Md., the U.S. public health service and elsewhere indicated the solution of the mystery as a change in character of penicillin. In 1946 appeared the results of ten years of the most intensive and confidential chemical studies of penicillin. It was revealed by these combined clinical and chemical studies that several substances, among them penicillins G, F, X and K, all chemically much alike, were produced in varying proportions by various strains of Penicillin notatum under different growth conditions. Some of these products, like penicillin K, were shown to be less effective than others, especially in the treatment of syphilis and, when inadvertently present in the commercial product, with compensatory diminution of more effective penicillins such as X and G, caused the clinical failures previously mentioned that were so discouraging before the nature of the different penicillins was discovered.

While the dramatic history of penicillin was being evolved, parallel work was carried on by bacteriologists seeking substances similar to penicillin but of bacterial origin. Many bacteriotoxic substances of microbial origin similar to penicillin were announced during 1937–46, among them bacitracin, subtilin and clavacin.

The Rockefeller institute in New York announced in 1939 the discovery of a substance (tyrothricin) in cultures of a soil bacterium (B. brevis) from which two other substances (gramicidin and tyrocidin) were later separated. Their action was found to be roughly similar to that of penicillin. However, after much clinical trial during 1940–44, these proved to be too toxic for injection, although it was found that they could be used for local application.

In 1944, scientists at Rutgers university, New Brunswick, N.J., discovered a substance analogous in many ways to penicillin, but produced by a mouldlike bacterium from soil, Actinomyces griseus. They called the substance streptomycin. In the two years after this discovery, the history of streptomycin underwent an evolution somewhat like that of penicillin, but with much of the way cleared by knowledge already gained in developing the latter drug. Improvements in methods of cultivation looking to greater yield, better means of concentration and purification, chemical analysis, and methods of assay and standardization were all worked out in 1944 and 1945. Clinical trials kept pace, and it was found that streptomycin, like penicillin, is relatively atoxic on injection. Streptomycin promised to be of use in several infections, notably tuberculosis, typhoid, brucellosis and some other diseases caused by gram-negative bacilli, not amenable to penicillin treatment. However, information was still very incomplete in 1946, and early enthusiasms over new drugs had repeatedly been found premature.

Bacterial Variation.—Interesting corollaries of these developments were discoveries and applications of new knowledge of the phenomenon of bacterial variation. It was found in 1940 and later that many bacteria, notably gonococci in the presence of doses of sulfa drugs not sufficient to destroy them at once, adjusted themselves to the sulfa drugs and survived, *i.e.*, the bacteria became drug resistant, or drug fast. The surviving bacteria could then cause gonorrhoea and other infections in spite of sulfa-drug therapy. Soon it appeared that the original drug-susceptible gonococci, and other susceptible bacteria among the population were being replaced by drug-fast strains, thus throwing shadows of doubt over the bright hopes for con-

trol of gonorrhoeal and other infections by means of the sulfa drugs. In 1945 and 1946, similar shadows appeared to darken the future for drugs like penicillin and streptomycin.

In another field the phenomenon of bacterial variation dispelled shadows, a dramatic example being the development of yellow fever vaccine. This story had its roots in the Afro-American slave trade which introduced yellow fever to the Americas. Walter Reed and his companions at the turn of the century revealed the aetiological agent and vector of yellow fever. It remained for scientists of the international health division of the Rockefeller foundation and the Departamento Nacional de Saude Publica of Brazil to develop during the 1937-46 decade an apparently safe and very effective yellow fever vaccine. By 1936, yellow fever virus had been biologically modified for vaccine by propagation first in the brains of mice (1932) and then (1936) by maintenance in tissue cultures so that it was of reduced viscerotropic but of normal neurotropic virulence. Vaccines made with these virus variants required the concomitant use of immune human or animal serum as a safety measure. In 1937, a further mutation occurred in the tissue-culture virus resulting in low neurotropic as well as low viscerotropic virulence. Vaccine prepared with this virus (called 17D) required no immune serum. The use of such material (17D virus) as a vaccine for public use against yellow fever was immediately begun in Brazil and West Africa. Later in that year, it was found that the 17D virus could be propagated on a large scale in whole, living, chick embryos in the egg, and vaccine was then prepared from inoculated eggs by suitable preparation of the chick embryos and suspension of the product in normal human serum. Such vaccine was found very effective and by 1942 had been used to vaccinate hundreds of thousands of persons in Brazil and elsewhere with only a few untoward results. Some of the persons vaccinated, especially with certain lots of vaccine, had developed jaundice (1939) and some an encephalitis. It was suggested that the results were not caused by the 17D virus itself, but might be the result of a contaminating virus in the human serum. However, experimental evidence at the time did not prove this. In 1941, in view of the probability that U.S. troops would be exposed to yellow fever, it was decided to immunize them with the vaccine. At the Rockefeller institute in New York, huge egg incubators and other facilities were established, large numbers of human blood-serum volunteers were called, and great quantities of the vaccine were prepared and injected into U.S. military personnel. After the appearance of numerous cases of icterus and some deaths, an extensive investigation in 1944 revealed that the agent responsible for the jaundice appeared to be a hitherto unknown filterable virus pathogenic for human beings and sometimes appearing in the blood of donors without producing symptoms. It became evident that the jaundice-producing principle had gained access to the vaccine by way of the serum, obtained from donors who were supposedly normal, and used in manufacture. Vaccine was afterward prepared without human serum and caused no jaundice.

Thus a new disease, called homologous serum jaundice, that probably would not otherwise have been recognized for years, was discovered, and the dangers of injection of human serum into human beings, a fairly general practice for some purposes, were revealed.

Epidemic jaundice still occurred among troops, however, and it was clear that there existed still another type of little understood disease producing a clinically similar picture. Field, laboratory and clinical investigations reported by members of the U.S. army medical corps and many other scientists, in 1944-46, resulted in a brilliant elucidation of the hitherto hazy relationships between homologous serum jaundice and the clinically similar diseases called infectious hepatitis, caused by a totally different agent and epidemiologically and immunologically wholly distinct. Infectious hepatitis was shown in 1945 and 1946 to be probably faecesborne.

Many other interesting reports appeared on bacterial variation during the decade. For example, it was demonstrated that the virus of fox encephalitis, cause of costly epidemics on fur ranches, could be diminished in virulence for foxes by passage through ferrets. An entirely successful living vaccine, preventing hundreds of thousands of dollars loss to fox fur ranchers, resulted.

In 1941, other scientists of the U.S. army medical corps summarized several years of studies dealing with changes in virulence of typhoid bacilli and the relation of these changes to the potency of prophylactic typhoid vaccines. They developed a typhoid vaccine for U.S. troops which was apparently far more effective than vaccines formerly used. It was later shown that after once receiving the usual preliminary series of three injections of typhoid vaccine, an annual injection of 0.1 ml. intradermally (a dose causing only a slight local swelling) maintained immunity at a protective level.

Still another application of knowledge of bacterial variation was made in the development of an effective antipertussis vaccine, former vaccines having been disapproved by the American Medical association because of their ineffectiveness. In 1936 it was already known that freshly isolated pertussis bacilli are, like freshly isolated typhoid bacilli, smooth and virulent (called Phase I) and that on cultivation on any but Bordet-Gengou or equivalent media, they undergo degenerative variations resulting in saprophytism and R forms. In 1939, it was shown at the University of Virginia, Charlottesville, Va., that pertussis vaccines made from smooth (Phase I) variants are far better, as measured by mouse protection tests, than vaccine made with the saprophytic variants. Evidence was also presented indicating that discredited pertussis vaccines had probably been made with saprophytic variants. These were important observations because a great controversy had raged over the possible effectiveness of pertussis vaccine. Favourable results were obtained with pertussis vaccination by members of the Michigan state department of health (1936 and later), but these were in direct contrast with the negative results of other workers at Northwestern university (1936). No explanation for the difference had been found satisfactory by the end of the decade. Extensive investigations of pertussis vaccination were made by many workers in the United States and other countries during the decade before 1946, nearly all of which were favourable to the vaccine in some degree. The net result was the demonstration that pertussis vaccine is fairly effective for human vaccination if prepared with the Phase I variant of H. pertussis. In 1943, the Committee on Therapeutic Procedures for Acute Infectious Diseases and on Biology of the American Academy of Pediatrics recommended immunization against pertussis as a routine procedure, while in 1944 the Council on Pharmacy and Chemistry of the American Medical association voted to reconsider H. pertussis vaccine for inclusion in "New and Non-Official Remedies."

Another proof, and one of the most fundamentally significant demonstrations of the marvellous possibilities in bacterial variation, was given in the discovery in 1936 at the University of Rochester, Rochester, N.Y., that the

virus of rabbit fibroma, a disease peculiar to wild labbits, could be transformed so that it possessed all the properties of the virus of infectious myxomatosis, a related but quite different disease occurring only in domestic rabbits. The change could be induced by injecting into rabbits the fibroma virus mixed with heat-killed myxoma virus. The animals died with myxomatosis. The nature of the alteration in the fibroma virus was not elucidated, but a later series of researches of the most profound character, in transformations of pneumococcus types, revealed the possible mechanism and pointed the way to numerous exciting discoveries in the fields of cell physiology, the nature of genetic change, the nature of viruses, the cause of malignant growths and others.

These latter researches had their origin in a previous discovery that mice died of type III pneumococcus infections after being injected with a certain dose of living, non-typespecific, nonvirulent, rough pneumococci derived from type II, incapable of causing an infection, but mixed with heat-killed cells of virulent, smooth, type III pneumococci, which were also innocuous. It was later shown not only that the same alteration could be induced by similar mixtures in vitro, but that Berkefeld filtrates of extracts of dead cells of one type would confer permanently their virulence and type specificity on living, non-type-specific, nonvirulent, rough cells derived from another type. In 1944, a brilliant light was thrown on the mechanism involved in these transformations by scientists of the Rockefeller institute at New York when they isolated from the dead, type-III-specific cells a form of desoxyribonucleic acid of which so small an amount as 0.003 mg. in 2 ml., i.e., in dilution of 1:600 million, would induce genetically stable smoothness, virulence and type III specificity in living, non-type-specific, rough, nonvirulent type II-derived cells. Implications pointed out by the discoverers were that living entities, in this case pneumococci, could be treated under known conditions with a known substance so as to produce not only a predictable, permanently hereditable alteration in metabolism and growth characters, but a continued multiplication of the determinative chemical substance itself, as part of the new cells. Interesting inferences were drawn regarding mechanisms of heredity; the cause of cancers, which appear to result also from hereditable alterations in metabolism and growth characters of certain body cells; and the nature of viruses.

Microscopy.—The field of microscopy was also exceedingly active during the decade. About the beginning of the decade, the use of the short-wave length of electrons as a substitute for light in microscopes in which the glass lenses were replaced with circular electromagnets of variable strength, opened the way to magnifications and discoveries of minute structural details of bacteria and viruses and many other minute things never heretofore dreamed of. Starting from original work in 1935, and developed during the ensuing decade at the R.C.A. laboratories, the first announcements of a practical electron microscope of high power came in 1939 and 1940. Numerous scientists at the R.C.A. laboratories at Camden, N.J., the University of Pennsylvania, Philadelphia, Pa., and elsewhere made use of these instruments to reveal such details of bacteria as intercellular protoplasmic bridges between cocci and bacilli in chains, details of the cell walls of various bacteria, the relation of capsule to cell wall in pneumococci, various structural differentiations within the protoplasm of bacterial cells, the details concerning the combinations of various types of antigens and antibodies, hitherto unseen flagella on syphilis spirochetes, the "tadpole" configuration and internal structure and mode of action of certain

bacteriophages, the size and structure of smallpox, influenza, tobacco mosaic and other viruses and many other details.

An important improvement in technique was added in 1945 and 1946, when it was found at the University of Michigan, Ann Arbor, Mich., that by depositing obliquely an extremely thin coating of metallic vapour (chromium or gold) on films prepared for electron microscopy, the objects on films so coated appeared to cast shadows, giving pictures with startling sharpness of outline and almost three-dimensional in effect. These permitted the measurement of heights of objects photographed on flat surfaces, and revealed topographic and structural details not otherwise visible.

Other Bacteriological Advances.—In the war against venereal diseases, tremendous advances were made in development of laboratory procedures which contributed heavily to the development in penicillin treatment. Methods of preserving syphilis spirochetes for experimental purposes over periods of years by maintaining them at extremely low temperatures (-76°C.) were perfected at the Johns Hopkins School of Hygiene and Public Health. It was shown in the same laboratories that the danger of syphilis from blood-bank blood or dried plasma is negligible. Important new concepts of the biology of syphilitic infection and of the relationships between various related spirochetal diseases like yaws and "rabbit syphilis" were developed by the same workers.

The bacteriological history of the decade 1937-46 included many other discoveries of far-reaching significance. Much light was thrown on problems of bacterial metabolism, leading among other things to the development for various bacteria of culture media composed entirely of pure chemicals; bacteriological methods of vitamin assay; knowledge of carbon assimilation by the use of radioactive carbon; and knowledge of fermentation processes of great industrial value. Other important and interesting discoveries were the existence of a nonantitoxic form of immunity against diphtheria; the production of a practical vaccine against typhus fever by cultivation of the rickettsiae in the yolk of living chick embryos, which aided in Allied victories in Italy and elsewhere; observations on the occurrence of poliomyelitis virus in human faeces and its survival in flies, suggesting possible modes of transmission. and many others. Of utmost importance also were studies carried out in various parts of the U.S. during 1942-45 by the U.S. army medical corps in co-operation with the University of Minnesota, the University of California, the State University of Iowa, the Rockeseller foundation, the University of Michigan, Cornell university and others, which resulted in the demonstration by field trials, of a vaccine which confers on human beings resistance to two types of influenza virus. Development of the vaccine itself and evaluation of its antigenicity were greatly facilitated by the discovery in 1941 at the Rockefeller institute in New York that the erythrocytes of chicks are quantitatively agglutinated by the virus and that influenza immune bodies inhibit this agglutination in proportion to their concentration.

Mention must also be made of extensive studies made chiefly by the army medical corps on Q fever, a respiratory disease of rickettsial aetiology, which suggested it's wide-spread distribution and the importance of the disease, formerly obscure and almost unknown in the U.S. as late as 1946.

Another rickettsial disease little known in the U.S.,

tsutsugamushi or mite typhus, and brought into new prominence by its occurrence in U.S. troops in Pacific islands, was fully revealed in its aetiological, ecological, clinical, epidemiological and other relationships as a result of brilliant investigations partly carried out under fire by the United States of America Typhus commission.

In Nov. 1946, the long-anticipated announcement of the synthesis of benzylpenicillin was made, and unequivocal proof of the fact that it is identical with the natural product was given. (See also Chemotherapy; Epidemics and Public Health Control; Medicine.)

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Badminton

Least exacting of the racquet games, badminton experienced unusual growth during the decade 1937-46 in both popularity and calibre of competition. It was played extensively in all sectors of the United States except the deep south, as well as in Canada, Australia, Denmark, England, France, India, New Zealand, Mexico and Sweden.

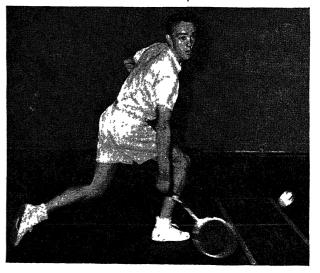
The shuttlecock sport produced one of the most dominant of all sports champions in David Guthrie Freeman, who from 1939 until 1942 won four successive men's singles titles. A tennis, ping-pong and squash player of note, Freeman had no equal after taking over the badminton crown in 1939. After service in the armed forces, Freeman returned to the game in 1946 with a domination of California sectional championships.

Of the six national championships held during the decade, the coveted men's singles title was held by only two players—Freeman and Walter Kramer of Detroit, Mich. Kramer won the championships in 1937 and 1938, after which Freeman brought the title to Pasadena, Calif. each year it was contested. He also shared the men's and mixed doubles championships from 1940 to 1942.

Badminton experienced a four-year recess in U.S. national tournament competition from 1943 through 1946. The various badminton associations, however, carried on with sectional tournaments. The game suffered even more acutely in other countries, with most national championships abandoned for the duration as early as 1939. Duration champions in men's and women's singles, including the last year they won their titles, were as follows: Australia-R. J. Harper and Mrs. H. B. Wray, 1939; Canada-James Snyder and Mrs. W. R. Walton, Jr., 1940; Denmark –Tage Madsen and Miss Tonni Olsen, 1939; France–Henri Pellizza and Mlle. Y. Girard, 1940; India-Daviner Mohan and Miss T. Deodhar, 1944; Malaya-Wong Peng Soon and Miss Lee CeeNeo, 1941; Mexico-F. Martinez Rico and Mrs. Norma Krafft, 1939; New Zealand-R. H. Lewis and Miss Mavis L. Kerr, 1939; Sweden-Haase Peterson and Miss Martha Holmstrom, 1942.

With Freeman topping the men's field, California added

Dave Freeman won his fourth straight U.S. badminton singles championship at Montclair, N.J., April 4, 1942, establishing an unequalled record for the decade 1937–46. He is shown at a practice match at Duke university



further to its prestige as a badminton centre by dominating women's competition. Evelyn Boldrick of San Diego became the second two-time national women's champion, winning the titles in 1940 and 1942. Mrs. Del Barkhuff of Seattle, Wash., won the titles in 1937 and 1938. Thelma Scovil and Janet Wright of San Francisco stepped to the fore in California wartime tournaments.

Tournament badminton received its impetus with

the formation of the American Badminton association in 1936, its membership growing from 155 clubs to 229 in its second year. The association and associate members sponsored 40 sectional tournaments during 1938.

1943-46-No championships held

The year 1939 marked the downfall of Jack Purcell of Canada, long-standing star of the professional field and the rise of Bill Markham, New York pro; it also brought Freeman into championship ascendancy. Having won the national singles in 1939, Freeman extended his laurels into men's and mixed doubles and became the duration champion in all three events. He teamed with Chester Goss of Los Angeles to win the men's doubles in 1940–41–42, and joined Sara Williams of Spokane, Wash., to win the mixed doubles over the same period.

Carl Loveday of Montclair, N.J., replaced Kramer as Freeman's chief singles opposition in 1941 and 1942, but it made no difference. Freeman defeated Loveday, 15-5, 15-10, in the singles championship final of 1942, after which World War II forced postponement of all U.S. national events. The game was restricted to sectional tournaments during the war, with Loveday dominating play in the east during 1943. Richard Casey of St. Louis captured the midwest singles title, with Pearl Peterson of Detroit the sector's leading feminine player. Helen Noble and LeRoy Erickson, both of Pasadena, topped Pacific coast competition in 1943.

Casey continued as midwest champion in 1944, and Eleanor Coambs of Chicago replaced Miss Peterson as women's titlist. Janet Wright and Erickson won both the southern and northern California singles during 1944. The former continued to dominate Pacific coast women's play in 1945, winning both the northern and southern California titles and bowing only to Helen Noble of Pasadena in the Pacific southwest singles. Bernard McCay of Pasadena also won two out of California's three major tournaments. Players from St. Louis, Mo., dominated the midwest championships, with Casey capturing his third singles title. Marie Bytnor, also of St. Louis, won the women's singles championship. Eastern competition throughout the war years was restricted principally to doubles.

Freeman returned to civilian life to dominate every badminton tournament he entered in 1946. He won both the northern and southern California singles, defeating a fellow Pasadena player, Barney McCay in each final. Freeman won the northern title, 15-12, 15-11, and the southern title, 15-5, 15-1. Thelma Scovil of San Francisco won the southern California women's crown, while Shirley Blanchet captured the northern crown.

Loveday dominated play in the east, with singles vic-

	U.S. Bad	minton Champions					
Men's	Singles	Women's	Singles				
Champion	Runner-up	Champion	Runner-up				
1937—Walter R. Kramer 1938—Walter R. Kramer 1939—Dave Freeman 1940—Dave Freeman Walter R. Kramer 1941—Dave Freeman Carl Loveday 1942—Dave Freeman Carl Loveday 1943—46—no championships held		1937—Mrs. Del Barkhuff 1938—Mrs. Del Barkhuff 1939—Mary E. Whittemore 1940—Evelyn Boldrick 1941—Thelma Kingsbury 1942—Evelyn Boldrick	Mrs. Roy C. Bergma Mary E. Whittemore Helen Gibson Zoe G. Smith Evelyn Boldrick Janet Wright				
Men's Do	ubles	Women's	Women's Doubles				
1937—Chester Goss and Do 1938—Hamilton Law and Di 1939—Hamilton Law and Di 1940—Chester Goss and Do 1941—Chester Goss and Do 1942—Chester Goss and Do 1943—46—No championships	ck Yeager ck Yeager ive Freeman ive Freeman ive Freeman	1937—Mrs. Del Barkhuff an 1938—Mrs. Roy Bergman a 1939—Mrs. Del Barkhuff ar 1940—Betty Anselm and H 1941—Thelma Kingsbury ar 1942—Evelyn Boldrick and	nd Helen Gibson Id Zoe Smith Belen Zabriskie Ind Janet Wright				
Mixed Do	ubles	Veterans'	Doubles				
1937—Mrs. Del Barkhuff and 1938—Mrs. Del Barkhuff and 1939—Zoe Smith and Richar 1940—Sara Williams and D 1941—Sara Williams and D 1942—Sara Williams and D	d Hamilton Law d Yeager ave Freeman ave Freeman	No championship held 1938—Herbert Hendiques a 1939—C. R. Hutchinson and 1940—Tim Royce and Geor 1941—L. R. Gustavson and 1942—L. R. Gustavson and	L. R. Gustavson ge McCook C. R. Hutchinson				

tories in the Buffalo National Invitational and the eastern championships. Patsy Donovan Starrett of Buffalo won the national invitational singles. Casey again led St. Louis players to midwest tournament honours, repeating as singles champion with an 18-17, 15-11 conquest of Russell Smith, also of St. Louis. Miss Coambs regained the midwest women's single title she held in 1944.

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Badoglio, Pietro

Badoglio (1871–), Italian army officer, was born Sept. 28, 1871, at Grazzano Monferrato, Piedmont. He saw service in the Eritrean campaign of 1896-97, and served in World War I, from which he emerged as a general. He was elected a senator in 1919 and was made chief of the army general staff in 1925. He was created Marchese del Sabotino in 1928 and served as governor general of Libya, 1928-33. He participated in the Ethiopian campaign and in 1936 was named viceroy of Abyssinia. He later resigned as viceroy and was created duke of Addis Ababa. Following Mussolini's declaration of war against the Allies in June 1940, Marshal Badoglio assumed command of all Italian armed forces. Made the scapegoat for the failure of the Italian invasion of Greece, he resigned as chief of the general staff "at his own request," (Dec. 6, 1941). Eighteen months later, Badoglio emerged from obscurity to become premier, July 25, 1943, after Mussolini's ouster. On Sept. 3, the marshal concluded a secret military armistice with Gen. Eisenhower and five days later (Sept. 8), Badoglio told the Italian people that he had signed the Allied unconditional surrender terms. On Oct. 13, 1943, he declared war against Germany, and Italy joined the Allies as a co-belligerent. After the liberation of Rome, Badoglio stepped down as premier and was succeeded by Ivanoe Bonomi, June 9, 1944. At the Nuernberg trial, secret documents were introduced in evidence (Feb. 2, 1946), which said Marshal Badoglio was a member of a world-wide anti-Hitler group behind the bombing attempt on Hitler's life in July 1944.

Bagramyan, Ivan C.

Bagramyan (1895?—), Russian army officer, was born in Gyandzak, near Kirov-Abad, of Russian-Armenian parentage. An officer in the Czarist army, he joined the Red army during the revolution and was with a cavalry regiment of the Armenian division. He was appointed regimental commander in 1924 and in 1930 entered Frunze

Military academy at Moscow. After graduation, he continued his military studies in the General Staff academy, where he later served as instructor for three years. When Germany invaded the soviet union in June 1941, Bagramyan was serving in the Ukraine. He participated in the Russian victories at Kharkov, Kursk and Vitebsk and was promoted to the rank of lieutenant general and assistant chief of staff. In 1943, he commanded the 1st Baltic army which breached the German lines at Nevel and in Sept. 1944, the 1st Baltic army participated in the soviet offensive below Riga. Stalin promoted him to colonel general and he was awarded the Order of Kutuzov, first degree.

Bahamas

The Bahamas, an archipelago of about 3,000 islands, islets (or cays) and rocks, east of Florida and north of Cuba, extend about 800 mi. in length, lying between 21° and 27° N. latitude and 72° and 79° W. longitude. The islands are organized politically as a British colony and are generally considered as part of the British West Indies. The capital and only city is Nassau (pop. 19,756). Area: 4,403.5 sq.mi.; pop. (1943 census): 68,846 of whom 29,391 were on the island of New Providence. The population by the 1931 census was 59,828; official estimates in 1939 placed it at 67,729 and in 1940 at 66,219. The racial distribution was about 87% Negro and 13% white, chiefly of British origin. The population density of New Providence Island, by the 1943 census, was more than 500 per sq.mi; that of the remaining islands was less than 16 per sq.mi. The constitution of the crown colony (granted in 1728) provided for a legislative council of nine crown-appointed members, a house of assembly of 29 members elected by 15 districts, and a crown-appointed governor aided by an executive council of not more than nine, Governors during the decade 1937-46: Sir Bede Clifford, until May 1937; Sir C. C. F. Dundas, May 1937-July 9, 1940; H.R.H. the Duke of Windsor, July 9, 1940-July 28, 1945; William L. Murphy, after July 28, 1945.

the years 1937-46 was the readjustment of the islands to wartime conditions and problems, both political and economic. The tourist trade had always been an essential factor in the economy of the archipelago, and tourists in 1937 reached the peak number of 57,765. This number tended to decline rapidly thereafter, especially after the outbreak of World War II, and as early as 1938 the colonial government was taking steps to increase the tourist trade; action was taken at that time to welcome "ship-hotels." In a further effort to encourage tourist traffic, the government in 1939 waived passport regulations. By 1941 the declining number of tourists had forced the closing of many hotels; only 25,000 tourists were estimated to have visited the islands in that year, spending an estimated \$4,000,000 in the colony. Tourist trade continued to drop sharply in 1942 and later war years; by 1943 tourists numbered only 3,652. By the end of 1945 this mainstay of Bahamian economy was improving, however, especially

THE PRINCIPAL factor in Bahamian development during

Labour difficulties of various sorts occurred during the decade. A serious and spectacular riotous outbreak took place on Great Inagua, the southernmost large island, in Aug. 1937, during the course of which one person was killed and 15 deported by the rioters. On the night of

with the expansion of air services to Nassau from New

York and Miami.



Duke of Windsor, then governor of the Bahamas, and the duchess greeting crowds in Chicago as they were en route to Calgary, Canada, in Sept. 1941

May 31, 1942, serious rioting broke out in New Providence as the result of a labour dispute. Two of the 88 rioters were killed. War projects undertaken by the British and U.S. governments at Nassau and elsewhere during 1942 and later years caused a considerable labour shortage for a time, especially in forms of employment which could not compete with the high wages paid on government projects, but it was necessary in the latter part of 1943 for the colonial government to set up a special Out Islands department, designed to formulate work projects which would draw unemployed workers away from the capital. An arrangement was made in May 1943 for the transportation of up to 6,000 Bahama labourers to Florida to fill labour demands there. The colonial government in 1944 undertook a road building program for islands other than New Providence, partly with the design of relieving unemployment. The policy of temporarily transporting workers to the U.S. was only partially successful; by March 1944 only some 3,000 had migrated to the U.S. for agricultural labour, although 2,000 additional workers were then being

Outbreak of the war in Sept. 1939 was met in the Bahamas by legislative action putting the colony on a war footing, imposing a censorship, and appointing a food control committee to regulate prices and distribution of food. A popular subscription in 1940 raised more than $f_{20,000}$ for the purchase of aircraft for the royal air force, and during the same year the colonial government loaned to the British government the colony's treasury surplus of £250,000 on an interest-free basis for the duration of the war. The Bahamas in 1941 made extensive gifts of metals, money and foodstuffs to the empire cause and a further. interest-free loan of £100,000. Wartime financial conditions remained fairly satisfactory in 1943, although the war continued seriously to affect the Bahamas. Price control was effectively established in Dec. 1942; rationing of essential foodstuffs became necessary the following July.

Consummation of the Roosevelt-Churchill destroyernaval base agreement in 1940 involved the Bahamas as the site of two such bases. Mayaguana and Great Exuma islands were later agreed on as the specific sites, and initial work was undertaken in 1941. The U.S. formally took over the naval and air bases in September of that year, although construction had not yet been completed. Tempo of the work increased in 1942-43 and was continued actively until construction ceased in Nov. 1943; this work between May 1942 and Nov. 1943 resulted in an expenditure of £1,113,059. Speculation existed in the latter part of 1945 about the possibility of commercial use of wartime aviation installations.

Transportation and other economic factors were seriously affected by the war. The colonial government as early as 1939 completed a modern dial-telephone system for the city of Nassau at a cost of almost £70,000. The islands' main transportation links to the U.S. had been by means of tri-weekly air flights and services furnished by five steamship lines. Wartime exigencies brought quick disruption of the latter and the government was compelled, in Nov. 1939, to subsidize a U.S. line to maintain service through the winter. Maintenance of regularly scheduled shipping connections with the U.S. and other places became increasingly difficult in 1940 and 1941. With the conclusion of the war in 1945, transportation services appeared to be headed for a considerable expansion; six air lines were in that year considering the inclusion of Nassau in their itineraries. In the same year domestic transportation was improved by the completion of a 71-mi. road from Gregory Town to Bannerman Town on the island of Eleuthera.

Appointment of the duke of Windsor in 1940 as governor and commander-in-chief aroused considerable outside interest in the archipelago. The duke took an active part in Bahamian affairs until his resignation as governor on March 15, 1945 (effective July 28, 1945). He followed his resignation with the presentation to the chamber of commerce on March 29 of a development program for the islands and with a farewell address to the assembly on

April 4. A sensational development in Bahamian history occurred in July 1943 in the murder of Sir Harry Oakes, richest resident of the islands. His son-in-law, Alfred de Marigny, was accused of the crime but won acquittal in Dec. 1943 after a spectacular trial; the murderer was not discovered.

Considerable modification of production patterns and consumer habits was caused by the war at various stages. Since many goods, including foodstuffs, had been normally imported, the early disruption of shipping services quickly resulted in a shortage of consumer goods and in a rising cost of living. A partial remedy for the economic dislocation was found in the considerable sums remitted to the islands by agricultural and other workers who migrated to the U.S. during World War II; these remittances continued in fairly large volume through 1945. Inflation continued, however, and hence little improvement in living conditions resulted as a consequence of wartime prosperity. Merchants were the chief beneficiaries of the changed economic situation. The cost of living by 1945 was 125% above that for 1939.

Sponges in earlier years constituted a major export, but because of the prevalence of disease in 1938-39, all sponging grounds were closed by the government during 1941 and 1942. The industry remained practically suspended in 1943 and 1944 but by 1945 it showed signs of recovering. Sisal development in the Out Islands was greatly stimulated in 1942 by an agreement on the part of the U.S. to buy all the output as a partial substitute for blocked Philippine imports. In the same year a ten-year contract for the export of Bahamian spices (chili peppers, dill, fennel, ginger, paprika, pimientos, sesame seed, thyme and turmeric) to the U.S. was also consummated. The colonial government in 1943 took steps to promote seafood exports and straw and shellwork as a partial offset to the disrupted sponge industry. The government in 1944 imported 120,ooo mulberry cuttings from Venezuela in the hope of establishing a silk industry; only 40,000 of the cuttings survived; these were sold below cost by the British Caribbean Silk company, which also supplied the necessary silkworm eggs. Various oil companies sent representatives to the Bahamas in the early part of 1945 to investigate prospects for production, although no drilling was then undertaken. It was announced in mid-1946 by a Bahamian subsidiary of the Standard Oil Company of New Jersey that radar would be employed to hunt for oil underneath the ocean floor off the Bahamas.

Problems of political reformation arose at times during

Bahamas: Statistical Data								
	1938	1942						
 -	Value Amount or (000's omitted) Number	Value Amount or (000's omitted) Number						
Exchange rate	£1 = \$4.889	£1 = \$4.035						
Finance Government Revenues	. £412 (\$2,013) . £656 (\$3,205) . £253 (\$1,237)	£671 (\$2,709) £626 (\$2,525) £127 (\$513)						
Transportation Highways	. 1,033 mi.							
Communication Telephones	1,154	1,361 1,208						
Minerals Salt†	. 133,000 bu.	169,000 bu.						
Crops Sweet Potatoes Pigeon Peas		6,720 tons* 3,920 ,, * 3,808 ,, * 2,464 ,, *						
Livestock Poultry Sheep Goats Swine Poultry Round Roun	. 32,092 . 13,178 . 6,198 . 5,980	40,000* 17,000* 10,000* 4,500*						
Forest Products Abaco Pine Timber	. 35 tons†							
Sea Products Sponges†	. 332 tons . 558 tons	6 tons‡						
Exports Total Sponges Tomatoes (raw) Lumber	. £148 (\$726) £84 (\$411) 332 tons . £25 (\$124) 67,000 bu. . £9 (\$44) 1,303,000 bd.ft.	£228 (\$921) £11 (\$44) 20 tons £31 (\$125) 54,000 bu. £11 (\$45) 1,223,000 ft.						
Imports Total	. £1,139 (\$5,568) . £58 (\$284) . £55 (\$271) 5,366 tons . £49 (\$238) £46 (\$226)	£1,326 (\$5,352) £69 (\$280) £95 (\$383) 6,634 tons £49 (\$199) £20 (\$79)						
Education Elementary Schools	. 12,896	 25,077						
*1944. †Exports only.	‡1943 (reliable data no	ot available.)						

the decade. The house of assembly on July 4, 1944, rejected a move for the secret ballot and after disapproval by the legislative council the unusual step of appeal to the secretary of state for the colonies was taken six days later. The house of assembly on July 3, 1945, asked for a greater degree of responsible government. On July 23, 1946, it extended the secret ballot, previously provided for New Providence, to the Out Islands. Considerable discussion took place in the latter stages of the war about the possibility of inter-colonial federation among the British units in the Caribbean, but the house of assembly on July 3, 1945, unanimously rejected a proposal of the British government that the various West Indian colonies should give consideration to the possibility of federation. Nevertheless, commercial and quasipolitical relations among the different British Caribbean colonies were strengthened. (See also West Indies, British.)

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Bahrein Islands

See British Empire.

Baker Island

See PACIFIC ISLANDS, U.S.

Balance of Trade

See International Trade.

Balbo, Italo

Balbo (1896-1940), Italian statesman and aviator, was born in Ferrara, Italy, June 6, 1896. When Italy entered World War I in 1915 he enlisted in an Alpine corps and was decorated three times for gallantry. One of the early supporters of fascism, he was appointed undersecretary for air in Mussolini's cabinet in 1926 and in 1929 was named air minister. In 1933 he commanded 24 hydroplanes which flew from Rome to the Century of Progress exposition in Chicago and return. The flight made him so popular in Italy that he was mentioned as a possible successor to Mussolini. He was then appointed air marshal and governor general of Libya. He was killed June 28, 1940, according to an Italian communiqué, in an air battle over Tobruk, Libya, while fighting British planes. There were rumours, however, that his death had been planned and carried out by fellow-countrymen acting on orders from Mussolini.

Baldwin of Bewdley

Earl Baldwin of Bewdley (Stanley Baldwin, Viscount Corvedale) (1867—), British statesman, was born Aug. 3, 1867, at Stourport, Worcestershire, the son of an iron-master and M.P. He was educated at Harrow and Cambridge university, graduating from the latter institution in 1888. Elected to parliament in 1908 on the Conservative ticket, he became parliamentary private secretary to Bonar Law, then chancellor of the exchequer (1916). He was president of the Board of Trade in 1921 and was appointed chancellor of the exchequer in Law's cabinet in 1922. After Law's resignation because of ill health, Baldwin was named prime minister and leader of the party, May 20, 1923.

While the Conservatives were returned to power, a Liberal-Labour coalition voted "no confidence" in the new

government; as a result Baldwin resigned Jan. 22, 1924. The ensuing Labour government was short-lived and after the Conservative victory in the elections of Oct. 1924, Baldwin became prime minister again, Nov. 6, 1924. His gravest problem during his second tenure was the general strike of 1926.

In the general elections of May 1929, the Conservatives were swept from power and Baldwin resigned June 4, 1929. Caught in the great depression that started in that fateful year, Ramsay MacDonald subsequently formed a government of national unity, naming Baldwin to the post of lord president of the council (1931). After Mac-Donald's resignation, Baldwin took the helm for the third time, June 7, 1935. A year later, Baldwin, disturbed by the request of King Edward VIII that he be permitted to wed a U.S. divorcee, Mrs. Wallis Warfield Simpson, informed the king that this marriage would not receive the approbation of the people. Edward decided to forego the crown, marry Mrs. Simpson and leave Britain. After the coronation of the new king, George VI, Baldwin resigned May 28, 1937 and retired from public life. He was created 1st Earl Baldwin of Bewdley in 1937.

Balkan Entente

See Greece; Rumania; Turkey; Yugoslavia.

Balkan Literature

See Central European and Balkan Literature.

Ballet

See DANCE.

Ballroom Dancing

See DANCE.

Baltic States

See Estonia; Latvia; Lithuania.

Baltimore

The seventh largest U.S. city, Baltimore, Md., had a population of 859,100 by the federal census of 1940; by the end of World War II this figure had increased to an estimated 930,000, excluding military personnel. Area, 78.58 sq.mi., plus 13.35 sq.mi. of water.

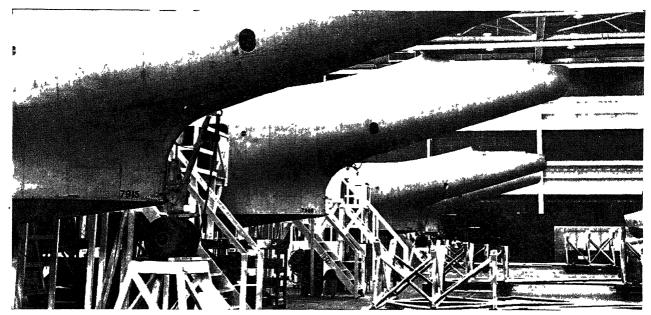
The white population in 1940 was 692,533; non-white, 166,567.

In 1937, Pan American Airways chose the Baltimore municipal airport as the base for its regular Bermuda service in conjunction with Imperial Airways and regular flights began Nov. 14. The first year of the decade 1937–46 also saw the first appointment of a Negro to the police force, the adoption of voting machines for all elections, the continuing substitution of busses for trolley cars and the razing of hundreds of buildings in the older parts of the city to make space for the parking of automobiles.

In 1939, Mayor Howard W. Jackson and comptroller R. Walter Graham were re-elected to office; Richard C. O'Connell was elected president of the City Council. A system of permanent registration of city voters was inaugurated.

A loan of \$5,000,000 for the sewerage system was approved by referendum in Nov. 1940. The first low-cost housing project was completed and opened for Negroes. Seven such projects were approved, estimated cost \$20,760,000. Three were for white families and four for Negroes.

The new municipal airport, opened Nov. 16, 1941, compared favourably with modern U.S. airports with its new-



Aircraft plant at Baltimore, Md., producing Martin PBM-3 mariner patrol bombers for the U.S. navy during World War II. This picture shows tail sections lined up in the plant's assembly room

type control towers and its airport and seaplane base facilities. Defense road construction called for an outlay of more than \$13,500,000. During 1941, Edmondson avenue was extended to the city line by a dual highway, and a cutoff was being built from the Philadelphia road to the Glenn L. Martin aviation plant.

Because of a decrease in city expenses of \$16,481 from tax levy funds, plus a decrease in the debt service and an increase of some \$94,000,000 in the taxable basis, a reduction of 20 cents per \$100 was possible in the tax rate for 1942.

War industries and steel plants accelerated operations to the fullest extent of available materials and workers after U.S. entry into World War II. Shipbuilding and aircraft plants maintained or exceeded schedules. Sixteen new industries and expansions in 90 plants were announced in the first twelve months after Pearl Harbor, and the boom continued throughout the remainder of the war. In addition to being an important shipbuilding, steel and aircraft manufacturing area, Baltimore became a major production centre of high-octane gasoline with the erection of a \$14,000 000 catalytic cracker at the Standard Oil Co. of N.J. refining plants in 1943. In 1944, the world's largest plant for the production of magnesium extruded shapes was completed.

Theodore R. McKeldin, Republican, was elected mayor May 4, 1943, and took office May 18, succeeding Jackson. His vote, 77,567, constituted a majority of 20,275 over Jackson, who was running for a 5th term. McKeldin, the first Republican mayor elected after 1927, received the largest majority ever given a Republican. Howard E. Crook, Democrat, was elected city comptroller. The council president, Thomas E. Conlon, Democrat, died in Oct., 1943, and the vacancy was filled by C. Markland Kelly. Democrats kept a solid membership in the city council.

For three successive years—1942-44 inclusive—business activity reached all-time peaks. Electric power output, department store sales and bank deposits all attained new high levels. The resources of Baltimore banks doubled during the war period. Shortly after V-E day in 1945, they aggregated \$1,659,700,000, representing about 75% of the bank resources of all Maryland.

The end of World War II brought a lessening of ship-building and ship-repair work. By 1946, reconversion was practically completed in most industries, the largest single reconversion project being that of the Chevrolet-Baltimore division of the General Motors corporation. Production continued vigorously in these lines, among others: metals and metal goods, distilled liquors, plastics and electrical goods (including radios). While many workers received unemployment compensation, few who desired available work were unable to obtain it. (C. B. S.; E. Gn.; X.)

Bananas

See FRUIT.

Bankers Association, American.

See Societies and Associations.

Bank for International Settlements

The prewar tension in Europe and World War II itself, as well as the postwar period, had their repercussions on the operations and management of the Bank for International Settlements. In the autumn of 1939 the governments in London and Paris, after careful consideration, came to the conclusion that the bank, to which an American, Thomas H. McKittrick, had just been appointed president, should not be discontinued during the war. The bank laid down for itself, at the same time, certain principles to which it strictly adhered; among them was the principle of scrupulous neutrality by which it limited itself to operations which would "stand as above reproach both from the point of view of belligerents and neutrals." As a result, the volume of the bank's business was considerably reduced but, even so, it was able to render services to many central banks, and especially those of countries which were occupied in the course of hostilities; for instance, it held gold and deposits for the account of such banks all through the war years.

The total of the bank's balance sheet, which at the end of March 1937 stood at 619,000,000 Swiss gold francs, was reduced to 451,000,000 Swiss gold francs by the end of March 1946. Up to the very end of hostilities the bank was able to obtain full transfer of interest earned on its investments in different markets. In addition, substantial reimbursements were obtained on credits granted before

the war in various countries on the continent of Europe. The net assets of the bank on the U.S., British and Swiss markets, held in gold, dollars or Swiss francs, rose on the aggregate by more than 117,000,000 Swiss gold francs (the equivalent of nearly \$40,000,000) during the war period between Aug. 31, 1939, and March 31, 1945. In its 16th annual report, the bank stressed the fact that no attempt had been made from any quarter to influence, in an incorrect manner, the management of the bank in carrying out its affairs or to induce it to depart from the principles which had been adopted at the beginning of the war.

While the war lasted, the bank was able to cover its costs of administration and pay a dividend, which, however, gradually was reduced from 6% at the beginning of the war to the equivalent of 4.72% in 1943 and 4% in , 1944. In 1945 no dividend was paid; it was thought necessary to make the maximum possible provision for future contingencies. For the financial year 1945-46, a deficit was incurred, caused partly by transfer difficulties at the end of the war and partly by the maintenance, for the time being, of a high proportion of assets in gold. The bank's remaining investments in Germany were all made exclusively in the period 1930-31 and were the result of explicit obligations laid upon the bank by the Hague agreements in the interest of the countries which were the reparation creditors of Germany, the bank having, under those agreements, certain rights and privileges.

Throughout the war the bank continued to make available information regarding monetary regulations, clearing arrangements, etc. and, in particular, to publish its annual reports, containing extensive reviews of the economic and monetary situation all over the world, but particularly in Europe. These annual reports were, in fact, much enlarged, extending to more than 300 pages, in response to a universal demand for information at a time when most other reports of a general character were no longer issued. Covering the postwar period, the 15th annual report was published by the end of 1945 and the 16th report in July 1946. (See also International Bank for Reconstruction and Development.)

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Bankhead, William Brockman

Bankhead (1874-1940), U.S. statesman, was born in Moscow, Ala., April 12, 1874, the son of John Hollis Bankhead, who later was elected to the United States senate. He was graduated from the University of Alabama in 1893 and from Georgetown university law school in 1895. After two years in New York city he went to Huntsville, Ala., where he began the practice of law. He served one term in the Alabama legislature and in 1916 was elected to the national house of representatives, and was re-elected to 11 successive congresses thereafter. He was named chairman of the house rules committee in 1934 and floor leader in 1935, and in 1936 he was unanimously elected speaker to succeed Joseph W. Byrns, who had died in office. He was the keynote speaker at the Democratic national convention in Chicago in 1940 and was an active candidate for nomination for vicepresident but was defeated in the convention. He died Sept. 15, 1940, in Washington, D.C.

Banking

At the end of 1946 there were more than five times as many banking units in the United States as there were in all the rest of the world. This was true despite the fact that there had been a steady decline in the number of banks from the high point of 31,811 in 1921. The number at the end of 1946 was 14,838. The number of banks in all other countries was only 2,843.

Likewise, there were more dollars of resources in U.S. banks than in any other country. The high point in total resources was reached in 1946, when the bank resources for all 48 states amounted to more than \$173,000,000,000. Of the total, nearly \$161,000,000,000 were deposits.

To indicate the tremendous growth during the decade, it should be noted that in 1936, the total resources were only about \$70,500,000,000. That year, deposits totalled only \$61,500,000,000.

By comparison, the total assets of 11 London banks (known as the "clearing house banks") were \$28,034,000,000 in 1946. The 11 largest banks of the U.S. had assets of \$33,633,901,000 that same year. The total assets of all 10 Canadian banks were a little less than \$9,000,000,000. Two of the largest banks in the United States together had total resources greater than the latter amount.

All of these figures represented tremendous growth for the decade 1937–46. The growth is shown by the following comparison of total resources of banks in the three countries for the years 1936 and 1946.

Table I.—Total Resources of U.S., London and 10 Canadian Banks, 1936 and 1946

United States Banks
1936 . . . \$70,425,027,000 (15,738 banks)
1946 . . . \$173,263,977,000 (21 banks)
1946 . . . \$173,263,977,000 (14,861 banks)

U Canadian Banks, 1936 and 1946

10 Canadian Banks

10 Canadian Banks

10 Canadian Banks

23,140,000,000

(18 banks)

The largest bank in the United States was the Bank of America, National Trust and Savings association of San Francisco, Calif., with total resources on June 29, 1946, of \$5,500,000,000. The second bank in point of size on that date was the Chase National bank of New York city; it had more than \$5,000,000,000 in total resources.

The National City bank of New York had more than \$5,000,000,000; the Guaranty Trust company of New York had more than \$3,000,000,000; the Manufacturers Trust company of New York had more than \$2,000,000,000. The Continental Illinois National Bank and Trust company of Chicago had more than \$2,000,000,000, as did the First National bank of Chicago.

The Bank of England had total resources of \$1,881,000,000, Oct. 30, 1946. The largest London bank, Midland bank, had resources of less than \$2,000,000,000. The largest bank in Canada, the Royal Bank of Canada, had total resources on the same date of more than \$2,000,000,000. There were 3 other banks in Canada with more than \$1,000,000,000 in total resources: the Bank of Canada, the Canadian Bank of Commerce and the Bank of Montreal.

Four large French banks had total resources of \$1,970,337,600.

There was a time when the largest bank of the world was in England, but the United States in 1946 had eight banks, each larger than any London bank in total resources. There were 16 U.S. banks with more than \$1,000,000,000 in total resources each, 3 with more than \$5,000,000,000,4 with more than \$3,000,000,000 and 7 with more than \$2,000,000,000. This tremendous growth was not entirely because of World War II; between 1936 and 1940, for example, the total resources of banks in the United States increased more than \$10,000,000,000. Between 1940 and 1946, the increase was more than \$96,000,000,000.

Small Changes in Capital.—While the capital structure of U.S. banks increased as deposits increased, the actual amount of capital in dollars was not much more in 1946 than it was in 1923. However, there were more than twice as many banks in 1923, which indicated that banks had more than twice as much capital per bank in 1946.

Capital funds greatly increased as deposits increased. For example, when deposits were only \$47,000,000,000 in 1923, capital funds were nearly \$7,000,000,000. In 1936 deposits had increased to \$58,000,000,000 and total capital funds increased to more than \$8,000,000,000. In 1946 when deposits were at the high point of \$161,000,000,000, capital funds were at the all-time high of \$11,500,000,000.

The plan for protecting depositors in United States banks was to increase surplus and reserve rather than to increase capital, for capital appears to remain about the same in total dollars no matter where the deposit total goes. There had never been a time when the capital of all U.S. banks was so much as \$4,000,000,000. Likewise, when deposits got down to \$42,000,000,000 in 1933, there was still more than \$3,000,000,000 in capital.

Surplus is largely built up from bank earnings, and most banks pride themselves on having surplus equal to or greater than capital. In 1946 capital stood at a little more than \$3,000,000,000, whereas surplus was nearly \$5,500,000,000. In addition to that, there was a reserve fund including undivided profits of \$2,702,818,000.

It should be understood that undivided profits are earnings from which dividends are paid to stockholders. However, the board of directors of a bank sets aside a part of these undivided profits for reserves. In some cases, there are several different kinds of reserves with titles such as the following: reserves for contingencies, reserves for losses on loans, reserves for losses on securities. If and when losses do occur, they are paid out of these reserve funds. Because of this type of capital structure, individual banks are able to withstand tremendous losses if they should occur. As a matter of fact, losses were very small in banks of the United States during the decade 1937-46, actually totalling less than 1% of invested funds. The record of most banks was only a very small percentage of 1%. Lending and investment policies of U.S. banks had been so highly developed that losses seldom occurred.

Multiplication of Earning Assets.—Inasmuch as a bank's expenses and profits must be earned largely by investing the funds on deposit, it is important to know how these funds are invested and at what rate. As already noted, deposits greatly increased during the decade. Also during those ten years, investments in government bonds and in loans and discounts were increased by a large amount. For example, investments of banks in the United States in government securities rose from \$17,000,000,000 to \$96,-500,000,000. Investments in loans and discounts increased about \$11,000,000,000, from about \$21,000,000,000 to \$32,-000,000,000. The one classification which showed a decline was "other securities," including bonds issued by railroads, municipalities, public utility companies and commercial firms. Total investments in "other securities" decreased from about \$11,000,000,000 in 1936 to \$9,000,000,000 in 1946.

The total invested funds of banks of the United States in 1946 were nearly three times as much as in either 1936 or 1923. In 1923 the total of invested funds was about \$46,000,000,000. In 1936 they had increased to nearly \$49,000,000,000. In 1946 they stood at \$137,651,811,000.

Decline of Interest Rates.—The decade was an era of declining interest rates; while deposits and invested funds increased, the rate of earnings on these funds declined.

As an indication of this, the rates on government bonds made the following changes: in 1943 government bonds maturing in 7-9 years and taxable yielded a rate of 1.96%; in 1944, 1.94%; in 1945, 1.60%. There was a little gain in 1946, the rate being 1.62%.

On bonds maturing in 15 years or more, and partially tax exempt, the rates were as follows: in 1943, 1.98%; 1944, 1.92%; 1945, 1.66%. There were no such bonds available in 1946. Fifteen-year and more maturity taxable bonds had a rate in 1943 of 2.47%; in 1944, 2.48%; 1945, 2.37%; 1946, 2.27%.

Government borrowing undoubtedly fixed rates which forced bank rates down. In 1943 the rate on commercial loans in 19 cities averaged 2.72%. In 1944 the rate was 2.39%. In 1945 the average was 2.09%. In 1946 it was 2.32%.

It must be emphasized that these were rates in the larger banks in the larger cities and for large well-secured loans. Rates in smaller banks were seldom that low. Some bankers in smaller places were still getting 6% as in previous years for most local loans; others were lending at 5% and a few at 4½% or 4%.

The income from municipal bonds issued by states, counties and cities also showed a decline in rate during the ten years. In 1943 the rate averaged 2.06%; in 1944, 1.86%; in 1945, 1.67%. There was a little improvement in 1946, with the rate averaging 1.87%.

Railroad bonds had an average yield of 3.64% in 1943, 3.39% in 1944, 3.06% in 1945 and 3.07% in 1946. Public utility bonds showed a decline during this period from 2.99% in 1943 to 2.77% in 1946. Railroad bonds also declined from 3.64% in 1943 to 3.07% in 1946.

Thus, the income of U.S. banks was not at so high a rate. It was fortunate, therefore, that deposits were at a high level during this period so that the banks in general had adequate earnings for increasing surplus and reserves and for paying good dividends.

Rates in other countries also declined during the period according to the following schedule of discount rates of central banks:

England: 1939, 4%; 1946, 2%.
France: 1936, 3%; 1946, 13½%.
Germany: 1936, 4%; 1946, 3½%.
Belgium: 1938, 4%; 1946, 2%.
Netherlands: 1936, 3%; 1946, 2½%.
Switzerland: 1936, 2%; 1946, 1½%.

It would appear reasonable to characterize the decade 1937-46 as one in which banking in the United States was becoming stabilized. The number of banks was being adjusted to commercial needs; the surplus and undivided profits and reserves of banks were being increased to correspond with increased deposits. Earning assets were increasing rapidly, although rates were going down.

Deposit Insurance.—Federal Deposit insurance originated in the United States in 1933. The federal law required that all national banks and all members of the federal reserve system join the Federal Deposit Insurance corporation (FDIC). Congress provided that the federal reserve system must advance funds in order to put FDIC on a solid footing at once, and the corporation assessed the insured members on the basis of their deposits. During the decade 1937–46, the funds of the FDIC, representing the insurance fees paid by member banks, increased to such an extent that officers of the corporation urged in 1946 that at least a part of the original capital supplied by the federal reserve system be returned. In other words, the banks themselves had built up a sufficient insurance

fund to protect all deposits in all insured banks up to \$5,000 against any loss from the closing of any insured bank.

There were very few bank closings during the decade, not only because of the protection offered by the fund, but also because of additional examinations made by the FDIC. Where these examinations disclosed a weak condition (which occurred in very few cases) recommendations were often made for merging the weak institution with some stronger one.

As another result of the satisfactory experience with deposit insurance, it was suggested that the insurance apply to deposits up to \$10,000 instead of \$5,000.

State banks which were not members of the federal reserve system were privileged to join the FDIC as well as members, and many of them did so during the decade. In 1938, for example, there were 997 state banks which were not insured, whereas at the end of 1946, there were only 696. These were all small institutions with state charters.

Modification of Investment Policies.—Investment policies of United States banks underwent changes during the decade in such a way as to reduce greatly the possibility of losses on investments made by banks. Much more caution was exercised in lending money on speculative real estate transactions such as the financing of subdivisions and the like. Also, more caution was exercised in the selection of bonds issued by foreign countries.

By the end of 1946, United States banks could supply funds for any industrial expansion; there was no limit to which loans could be made available to borrowers when industry was in legitimate need of funds. This was because of the correspondent system of banking and the federal reserve system. The correspondent system, with its interbank relations, had made it possible for one bank to borrow quickly from one or more other banks.

Term Loans.—Even large sums which were formerly obtained by industries only by issuing bonds could now be obtained by direct bank loans. If the sum required was larger than the legal limit of one bank, several banks together might set up a term loan commitment to be drawn against by the industry over a specified period in any amount up to the total and at any time.

This was one of the more important developments in U.S. banking during the decade. More term loan commitments were issued than ever before. As an example, a large corporation might have in mind expansions requiring the use of \$75,000,000. Not all of this would be needed at one time or for the total period over which the money might be used. The treasurer of the corporation, therefore, would go to one of its banks of deposit, or to a federal reserve bank, explain the situation, and supply all of the necessary information. This bank then would contact other banks (its correspondents) and a pool or syndicate would be set up whereby each bank agreed to supply a certain part of the credit and at certain rates.

The corporation would then be given a "commitment"—an authority to draw against the fund set up, as needed. For this commitment, the corporation would pay a very small fee which, in the end, was much less than it would cost the company to float a bond issue. With a commitment, any amount might be used at any time and be repaid as funds became available.

This arrangement was often referred to as a "revolving credit." If the commitment was for \$75,000,000, \$20,000,000 might be used in one year and returned the next.

Almost immediately, \$30,000,000 might be withdrawn and used; but in the meantime, only the commitment fee was paid on the total amount, and the interest rate agreed upon was paid only on the amount of money actually in use, and for only the period of time used.

Here again, the correspondent system showed its worth. If such a pool was for a large amount, usually it was larger banks that made up the pool. If it were for a small amount, a city correspondent originating the credit might include some of its country correspondents in the pool. Small banks would, therefore, benefit by this type of investment.

Participation Loans.—Another important development of the decade 1937–46 was the increased lending of federal reserve or correspondent bank funds in co-operation with other banks. Each unit bank was limited by law as to the total amount it could lend to any one borrower. If a bank in a country town had a demand for a big loan which was larger than it could legally make from its own funds, it could, in co-operation either with a correspondent or with the federal reserve bank, make the entire loan by the simple plan of sharing the loan with either the correspondent or the federal reserve bank, the larger bank taking the amount of loan above the legal limit of the smaller bank.

The extreme flexibility of credit, however, was best illustrated by the fact that, when a federal reserve bank loaned money, it did not lend its deposits which were the funds of member banks, but it actually created deposits by issuing federal reserve currency. This was a provision of the law which provided unusual benefits to U.S. business during the decade; it illustrated the fact that there was no limit to the amount of credit available to industry.

Individual Credit.—By the end of the decade, most U.S. banks had adopted the practice of lending to any person with an income, funds for the purchase of such commodities as automobiles, electric refrigerators, furniture, etc., to be repaid in convenient instalments either weekly or monthly. Prior to the decade, the majority of such loans had been made by small loan companies, industrial loan companies or credit unions. In 1936 commercial banks had outstanding loans of this type amounting to \$161,000,000, while loan companies at the same time had outstanding loans of \$301,000,000. The position was reversed, however, in 1946. In October of the latter year, commercial banks had a total outstanding of \$864,000,000 compared with only \$556,000,000 outstanding in small loan companies. In many cases, banks offered lower rates on these loans and greater convenience.

Checking Facilities.—Still another interesting development of the decade was the offering of bank-checking service to individuals who could not maintain a fairly large balance. While there were a number of different types of no-minimum-balance checking accounts, it was quite common for a bank to charge ten cents for each check written and allow the customer to keep any balance he desired. Thus, a person with a balance of only \$100 could have a bank account that saved him considerable time and expense because of his ability to write checks and mail them to his creditors.

A system of payment for banking service was also developed by which a customer paid for only that amount of service not covered by the income the bank derived from his balance. This type of service was commonly called "service charge service" and was used by customers with larger balances, and especially by those who must write many checks each month.

Banks devised various schedules by which they gave credit for the balance and made charges for the service used. Some larger accounts maintained balances sufficient to cover all the charges and had no service charge at all. Others had so many transactions that the service charge was necessary, but even in those cases, the total amount of the charge was comparatively small, and it represented an economy in the use of banking services over other methods of financial transactions.

New Types of Collateral.—A lending service known as "accounts receivable loans" had considerable growth during the decade 1937-46. A customer needing operating funds pledged his accounts receivable by providing the bank with a list. When the accounts were paid, the funds, being earmarked for the bank, were turned over to the bank to liquidate the loan. Some firms found it greatly to their advantage to use this new type of loan service. Another type, the "field warehouse loan," developed to a remarkable extent during the decade. "Field warehouse companies" with financial responsibility would take charge of a customer's raw products or finished goods in the customer's own warehouse. The company would actually rent the space in which the goods were stored, would place a bonded custodian in charge and issue warehouse receipts representing the quantity and quality of the goods in storage.

These receipts were accepted by banks as collateral for loans. The field warehouse company had custody of the goods and was responsible for keeping them intact until the bank issued a release for a part or all of them. If, for example, a borrower had need to withdraw a carload of goods thus stored for processing or shipment, he would make a satisfactory payment of part of his loan to the bank, and the bank would issue a release on the quantity of goods to be shipped. This release would then be turned over to the field warehouse company, and the goods would be loaded.

Reduction of Exchange Charging.—Among the many improvements in bank-operating techniques during the decade, one having to do with the charging of exchange on checks was notable. A number of U.S. banks had long made a charge against a check drawn on the bank by one of its customers; but this charge, instead of being made to the customer, was made to the payee.

If a local lumber dealer bought a carload of lumber and wrote a check for \$3,000 against his local bank payable to a wholesale lumber firm in a distant city, the lumber firm would not receive the full amount of the check because an amount was deducted by the bank on which the check was drawn (known as "exchange"). This amount had not been uniform (it might be as much as \$30) and, therefore, the system resulted in considerable confusion.

There was a marked tendency during the decade to eliminate this charge. A bank that paid all of its checks in full became known as a "par bank." The number of "par banks" increased to such an extent that only 2,095 banks were on the nonpar list as of Oct. 31, 1946. All national banks and all federal reserve member banks paid their checks at par. On the date mentioned, in addition to member banks, 5,057 nonmember banks were paying all of their checks at par.

Protest Charges.—A marked development during the decade in protest requirements was of great benefit to industry. The progress indicated that protest charges might be eliminated entirely except when the payee asked to have a check protested.

The law, as it stood at the end of the decade, required that a bank protest any foreign bill (payable at a bank in

a state other than the state in which the bill was drawn) dishonoured for any reason. When this was done, the notary public making the protest charged a fee, usually not uniform. Furthermore, these fees were assessed for a service which had been of no benefit to the payee. Therefore, not only bank executives but also members of the American Bar association developed a movement to bring about a change of the law in each state to require banks to protest dishonoured items only when the payee asked that such protest be made.

Britain's "Big Five."—The nationalization of the Bank of England was the high point in British banking during the decade 1937–46. (See BANK OF ENGLAND.)

The five largest British banks in order of size with their "deposits and other accounts" at the end of 1945 were as follows:

Bank of England	\$1,680,387,805
Midland bank	
Barclay's bank	917,775,560
Lloyd's bank	
Westminster bank	598,934,131

These 5 banks alone had 10,280 branches, many in other countries. There were eight banks with head offices in Scotland, and nine in Ireland.

Resources in British banks more than doubled during the 10-yr. period; assets of 21 British banks in 1936 were \$12,871,630,570, and the assets of 18 banks in 1945 were \$24,523,752,370.

The five largest privately owned banks continued to serve as London agents for banks in all countries. The Midland bank served banks in 46 countries, Barclay's in 61, Lloyd's in 73, Westminster in 52 and National Provincial in 94. British banking was emphatically international.

Branch Banking.—In all countries except the U.S., the branch-banking system continued to prevail. The 10 banks in Canada, for example, had 3,166 branches. When the branches of the United States banks were added to the head offices, there were 19,035 banking offices, but only about 1,000 United States banks had branches; all the others were single units. The 13,838 United States banks without branches were classified as "independent" institutions or "units."

Branch banking existed in 42 states and the District of Columbia in 1946, with the largest numbers in the following states: California (885), New York (753), Massachusetts, Michigan, North Carolina, Ohio, Washington and Wisconsin (each with more than 100). (J. Y. B.)

Mutual Savings Banks.—During the decade 1937-46 inclusive, international problems with their consequent impact upon national economy shaped the growth and activity of mutual savings banks. In the United States, three major developments dominated the operation of these institutions. The most spectacular was a 60% increase in deposits, most of which occurred in the 3 years

Table II.—Mutual Savings Banks of the United States
(As of Jan. 1 of each year)

	_	Assets	Amount Due Depositors	Surplus		No. of	Avg. Div. Rate Paid
	No. of	(000,000	(000,000	(000,000	Surplus	Accounts	During
Date	Banks	omitted)	omitted)	omitted)	Ratio	(000 omitte	ed) Year
1937	551	\$11,357	\$10,012	\$1,260	12.6%	14,398	2.53%
1938	550	11,500	10,126	1,319	13.0%	14,578	2.50%
1939	543	11,571	10,235	1,304	12.7%	15,156	2.25%
1940	540	11,810	10,480	1,299	12.4%	15,448	2.17%
1941	540	11,919	10.617	1,265	11.9%	15,624	2.04%
1942	53 <i>7</i>	11,794	10,489	1,271	12.1%	15,738	1.90%
1943	535	11,950	10,620	1,279	12.0%	15,294	1.88%
1944	535	13,042	11,707	1,326	11.3%	15,712	1.87%
1945	533	14.812	13,331	1,454	10.9%	16,321	1.78%
1946	532	17.013	15,332	1,628	10.6%	16,902	1.70%
1946	531	18,028	16,224	1.740	10.7%	17,436	1.66%
(July ?)			,		, ,	•	. ,,,

Table III.—Percentage Distribution of Assets, Mutual Savings Banks of the United States

End of			Cash	U.S. Govt.	Other Bonds	R.E. Mtge. Loans	Real Estate Owned	Other Assets
1936			4.80%	19.41%	22.57%	43.02%	7.17%	3.03%
1937	:		4.65%	21.25%	21.95%	42.14%	7.04%	2.97%
1938			4.95%	24.50%	19.52%	41.54%	6.72%	2.77%
1939			6.45%	26.22%	17.51 %	40.85%	6.23%	2.74%
1940			8.01%	26.80%	16.04%	40.59%	5.75%	2.81%
1941			7.04%	30.51%	14.06%	40.67%	4.76%	2.96%
1942			5.83%	36.68%	11.69%	39.35%	3 <i>.</i> 77%	2.68%
1943			5.81 %	45.89%	9.07%	34.55%	2.49%	2.19%
1944			3.94%	56.33%	7.24%	29.16%	1.36%	1.97%
1945			3.57%	62.78%	6.33%	24.77%	.78%	1.77%

ending Dec. 31, 1945. Less dramatic, but of great importance, was the change in the character of savings bank assets, and the contribution the banks made to the U.S. defense and war effort by acting as agents for the issuance and redemption of United States savings and war bonds.

The spectacular increase in savings bank deposits, occasioned by a 50% expansion in national income from 1940 to 1945 and a lack of consumer goods available for purchase, was accompanied by a steadily declining average dividend rate. The huge quantity of funds seeking investment, the necessity of maintaining a low-interest rate policy on the part of the government in order to facilitate financing World War II, and the virtual suspension of private borrowing resulted in a continuous decline in the investment return of all lending institutions. The consequent reduced earnings restrained any increase in dividends to depositors and retarded the accumulation of surplus assets. Large holdings of government bonds and the provision of generous reserves for mortgage revaluation provided the protection formerly supplied by rapid surplus accumulations.

Character of Assets.—Responding to the needs of the country, U.S. savings banks subscribed heavily to the war bond drives for their own accounts. At the end of 1945, 62.7% of all assets of these institutions were invested in government securities as compared to less than 20% in 1936. This represented an increase in government bond holdings of more than \$8,000,000,000. This increase resulted from the investment not only of new funds but also the proceeds of liquidation of other types of assets.

Prior to the depression of the 1930s, mortgage loans were the major outlet for savings bank funds. These investments, because of their relatively high return, greatly helped to provide income sufficient to pay substantial dividends on deposits and were a major contribution to community development. The collapse of real estate values in the depression, followed by heavy foreclosures, necessitated a long period of readjustment in many mortgage investments. Borrowers were given every consideration, and adjustments of principal to prevent foreclosure whenever possible were part of a realistic approach to the problem taken by the savings banks. If foreclosure was unavoidable, the property acquired was rehabilitated and sold; terms of the resulting purchase money mortgage almost invariably called for amortization of the outstanding debt. Liquidation of the "other real estate" account of the savings banks made up of properties taken by foreclosure or voluntary assignment had been almost entirely accomplished by the end of 1945.

During the decade 1937-46 many mutual savings banks were active in making mortgage loans issued by the Federal Housing authority. In the war period, when ordinary building was curtailed, loans on homes built under the war housing provisions of the National Housing act provided the chief opportunity for mortgage investments. After the war's end, loans to veterans insured by the Vet-

erans' administration furnished an additional outlet.

In spite of aggressive effort, savings banks found it very difficult to make sound additions to their mortgage portfolios. In 1936 this type of investment had accounted for 43% of the banks' assets, but in 1945 the percentage had shrunk to 25. Halting of construction during the depression, enforced curtailment of private building during the war and the postwar bottlenecks in materials and labour were the major factors in the scarcity of suitable new mortgage investments.

In New York state, the total permissible percentage of assets invested in noninsured mortgage loans was reduced by statute from 70% to 65%, including real estate acquired through foreclosure. On the other hand, authority to make loans insured by the Federal Housing administration was extended beyond the limits of the state to include all adjoining states. Mortgage loans not subject to insurance, on properties in adjoining states, were legalized provided the underlying security was situated within 25 mi. of the principal place of business of the lending bank. In 1943 New York savings banks were given authority to lend up to 80% of appraised value on single family, owner-occupied residences constructed not more than 2 years prior to the making of the loan, provided such property was within 50 mi. of the lending bank.

In other states, similar liberalization of mortgage-lending legislation sought to provide adequate credit for the construction of low-cost homes. In Connecticut, New Jersey, Vermont and Washington the percentage limitation of loans to appraised value was raised to 80%, and in Massachusetts to 75%. Formerly, limits had been set at 70%.

Until the depression of the 1930s, railroad bond investments ranked second in importance to real estate loans in most savings bank investment accounts. At the end of 1931 they represented 13.98% of the combined assets of all savings banks in the United States. At the end of 1945 they had fallen to 2.69% of total assets through liquidation of impaired liens and a general flight from the railroad security field.

Sale of Government Bonds to the Public.—In addition to the heavy purchase of government securities for their own accounts, savings banks were instrumental in placing a large volume of savings, defense and war savings bonds in the hands of individual investors as shown below:

Table IV.—Savings, Defense and War Savings Bonds Sold By Mutual Savings Banks in the U.S.

May 1, 1941-April 30, 1942	\$420,143,000
May 1, 1942-April 30, 1943	489,762,000
May 1, 1943-April 30, 1944	458,543,000
May 1, 1944-April 30, 1945	362,698,000
Total	\$1 731 146 000

Government expenditures for defense and World War II activities reached an aggregate of \$339,000,000,000 by mid-1946. This amount exceeded the increase in the national debt from 1941 to 1946 by \$128,000,000,000. Early in 1941, defense needs started to make heavy demands on the U.S. treasury, and in that year the department adopted a vigorous program to increase the sale to individual investors of U.S. savings bonds, Series E, F and G. Series E bonds were designed for the small investor and differed from the earlier issues of savings bonds only in the schedule of redemption values during the early years. If held to maturity they would yield to the purchaser the equivalent of 2.9% interest compounded semiannually. Series F and G bonds were designed for trustees, pension funds, large individual investors and corporations other than commercial banks. Their yield

During the war years, when government expenditures mounted, the need for placing as great a volume of U.S. treasury obligations in the hands of individual holders as possible became more acute. Government bonds purchased by commercial banks created bank deposits and resulted in the monetization of the government debt, thus becoming a potential source of inflation. Moreover, in view of the volume of government debt, it was most desirable, as a matter of public policy, to maintain a wide, popular distribution of bond ownership.

In the eight successive war loan drives, when sales of all types of securities were offered to the public, savings banks assumed an active part in this important sales project. The secretary of the treasury appointed a savings bank executive as liaison officer between the savings banks and the treasury. Savings bankers held important posts on war finance committees and savings bank employees joined the ranks of door-to-door salesmen. Extensive advertising and other promotional campaigns were launched by savings banks to promote war bond sales. Many of these campaigns were anti-inflationary in purpose, urging people to buy bonds, pay debts and spend carefully. The result was sales by mutual savings banks of more than \$1,700,000,000 of U.S. bonds during the years 1941-45, inclusive. This achievement earned for the banks and their staffs high commendation from the U.S. treasury department.

Although the designation of savings banks as issuing agents for Series E bonds and sales agents for Series F and G bonds was originally intended to facilitate war financing, banks continued to sell these obligations to the public. It became desirable to promote the sale of savings bonds to offset the redemptions which inevitably took place. Savings banks in general regarded the sale of savings bonds as an additional service to the public and not as competitive with their principal activities. These bonds, a ten-year investment, supplemented the easily withdrawn savings account. Many banks included savings bonds in a "packaged savings plan" designed to give a well-rounded financial program for the individual, including in some cases a bond subscription, a life insurance policy and a savings bank account.

Other Developments.—During the decade, the most evident occurrences affecting savings banks resulted directly from World War II, although other developments arising from general economic conditions and a desire to offer increased service to the public were of importance. As a whole, the banks were self-critical, realistic and progressive in meeting new problems and new competition from other types of savings institutions.

One of the developments of particular significance was the authorization in 1945 by the state of New York of savings bank investment in equity housing. Subject to conditions prescribed by the banking board, banks in that state could own the stock and obligations of corporations organized for the purpose of constructing housing. Prior to 1945, savings banks were not permitted to own and operate real estate except as acquired through foreclosure of a mortgage, or for use as a banking house. Under later regulations of the banking board, savings bank housing projects were intended for the lower and middle income groups since rentals were limited to \$25 per room per month.

In 1946, general conditions in the construction industry prevented the full use of this new field of investment. In common with all postwar housing attempts, construction of savings bank housing projects was seriously

hampered by scarcity of materials and strikes and a constant increase in the cost of building. Some progress was made, however, and New York savings banks entered into mutual agreements for the ultimate construction of 8 projects involving an approximate cost of \$46,500,000 and provision for 17,000 rooms. Five of the projects were located in New York city, one in Schenectady county, one in Dutchess county and one in Westchester county, all in New York state.

These savings bank housing projects were developed by the banks through the instrumentality of the Savings Banks Trust company, an institution wholly owned by the savings banks of the state. A special housing division of the trust company acted as a co-ordinating agency, making preliminary studies of need, location, design and costs. When working plans were tentatively completed, the original savings bank stockholders generally offered participation to savings banks in the immediate locality. The trust company supervised construction and served as the banks' agent until the project was completed.

The commonwealth of Massachusetts pioneered in the field of making personal loans available to borrowers at savings banks. In 1945 the commonwealth authorized its savings institutions to make unsecured personal loans up to \$1,000 to mortgagors for the purpose of repairing or remodelling mortgaged property. Subsequently, loans for any purpose on the note of one maker in amounts up to \$1,000 were authorized without security.

The end of the war revived services necessarily curtailed while hostilities continued. Foreign exchange services were again offered by savings banks for the purpose of selling foreign remittances. One New York city savings bank issued .025% of the total foreign remittances sold in the United States during the first year following the close of the war. Travel information bureaus, durable consumer goods and housing exhibits and special systematic savings plans were used to advantage in stimulating the habit of thrift. The public became educated to the convenience of savings bank money orders. During 1945, 915,000 money orders were issued by savings banks in New York state at a cost to purchasers lower than that charged for postal money orders.

Although not a new development, savings bank life insurance experienced an impressive growth during the decade. First introduced in Massachusetts in 1908, the movement did not spread outside that commonwealth until 30 years later when New York state adopted similar legislation. In 1941 Connecticut followed suit. By mid-1946 the savings bank life insurance system in the United States had more than \$379,000,000 of insurance in force (\$290,000,000 in Massachusetts, \$82,000,000 in New York, \$7,000,000 in Connecticut).

Savings bank life insurance was sold "over the counter," thereby eliminating the expense of canvassing, and thus reducing the cost of insurance to the purchaser. Medical examinations were required for all applicants and the usual standard types of policies, except industrial insurance, were issued. Both the New York and Connecticut statutes were patterned after the Massachusetts Savings Bank Life Insurance law. Since the life insurance departments were operated independently of the savings account business, insurance policies were not secured by assets of the savings bank but by the assets of the insurance department and a central reserve fund. Through operation of a central reserve fund, mortality losses of all savings bank insurance departments were equalized throughout

the state. The fund charged or credited insurance departments with amounts necessary to equalize the effect of variations of mortality of policyholders in particular insuring banks from the projected mortality of policyholders of all insuring banks.

The maximum amount of savings bank life insurance that could be purchased by an individual was limited by statute. In New York and Connecticut the limit was set at \$3,000 per individual. An issuing bank in New York could sell a policy for the full \$3,000 but was required to reinsure \$2,000 with two other insurance banks. An issuing bank in Connecticut was limited to \$1,000 on any one life but could assign an additional \$1,000 to each of two agency banks. The Massachusetts law permitted a \$1,000 policy to be bought by an individual from each issuing bank, the banks themselves having set a maximum limit of \$25,000 on any one life.

Deposit Insurance.—From the standpoint of internal management, a major development occurred in the savings bank system in 1943. In that year 121 savings banks in New York state, not previously members of the Federal Deposit Insurance corporation, were admitted to membership. Banks in several other states took like action with the result that by July 1946, 191 banks having 67% of the deposits and 63% of the accounts of all the 531 mutual savings banks in the country were members of the insurance corporation. Of the total of 191 member banks, 131 were located in New York, 22 in New Jersey and 38 in 12 other states.

Savings banks holding membership in the Federal Deposit Insurance corporation were subject to regular examination by that body as well as by the state supervisory agencies. To assist the board of the corporation in conducting its relations with savings banks, the corporation appointed an advisory council consisting of executives of leading member banks and representatives of the state supervisory authorities.

In Massachusetts and Connecticut, protection for depositors against loss was provided through central funds, financed by the banks within each state.

Group Activities.—In addition to the activities carried on by the National Association of Mutual Savings Banks and the various state associations, other organizations contributed to the well being of the savings banks. These organizations were jointly owned or controlled to perform services more efficiently. Of outstanding importance in this field were the Savings Banks Trust company and the Institutional Securities corporation, established by the savings banks in New York state in 1933, under special act of the legislature, to provide a means of increasing liquidity of assets.

The trust company started business with a capital and surplus of \$5,000,000 which was subscribed to by the banks in a fixed ratio to their deposits. Additional funds were raised from the issuance to the banks of capital debentures. The trust company found an important and profitable place in savings bank management by rendering many useful services, including investment advice and analysis, handling subscriptions to government bond issues, taking custody of portfolios, housing project development, money orders and other functions implicit in trust powers. In addition, the trust company was able to pay substantial interest on time deposits of savings bank funds while earning satisfactory returns for the stockholders. During the war the corporation also served as a depository for the United States government.

For the first ten years of its existence, the trust company, under appropriate committees, administered the mutual deposit insurance fund by which the New York mutual savings banks then insured their deposits, with the exception of two which had remained in the Federal Deposit Insurance corporation, after the termination of the temporary federal insurance fund in 1934. In administering the mutual fund, the Savings Banks Trust company assisted banks in the liquidation of substandard assets and facilitated a number of consolidations. Its services in this field were unique in the history of banking in the United States and were of highly constructive character. This activity came to an end in 1943 when the mutual fund was discontinued, and under the persuasion of the superintendent of banks all the savings banks of the state not formerly members of the Federal Deposit Insurance corporation joined the federal agency.

Under the revision of the state banking laws in 1938, the Savings Bank Trust company, or 20 or more savings banks acting together, could petition the state banking board to add new securities to those previously declared legal for investment by the savings banks. To mid-1946, the trust company was instrumental in obtaining the addition to the eligible lists of 117 corporate issues with an aggregate par value of \$4,508,000,000.

The Institutional Securities corporation, with authorized capital of \$10,000,000, was organized to provide extra liquidity through securing loans from the Reconstruction Finance corporation on mortgages purchased from the banks. When the need for this safeguard abated, the securities corporation broadened its activity to include the servicing of mortgage and real estate investments and investing in mortgages. To the extent authorized by the banking board, this corporation issued debentures to savings banks to obtain funds for investment in mortgages insured by the Federal Housing administration anywhere in the United States and in which individual banks were not permitted by law directly to invest their funds. This device broadened the investment field of the savings banks somewhat but was not greatly used because of the lack of opportunity for suitable investments.

In Massachusetts a similar program of joint investing was undertaken later by the establishment of the Savings Bank Investment fund, a vehicle through which the savings banks acquired an opportunity to invest in securities not eligible for purchase by individual banks. Banks could invest up to 10% of their deposits in the fund, which was managed by a board of directors elected by the directors of the Mutual Savings Central Fund, Inc., organized under a law adopted in 1932 to assist in providing funds for liquidity and maintained by contributions from all savings banks of the state.

Great Britain.—Deposits in the trustee savings banks of Great Britain experienced an even more spectacular growth than did the mutual savings banks in the United States after 1938. Table V shows a growth of 150% in deposits in British trustee savings banks, compared with a 50% increase for the same period in U.S. mutual savings banks:

Table V.—Balance Due to Depositors, Trustee Savings Banks

	March 31, 1938	October 31, 1945
Ordinary department *	£133,872,000	£483,509,000
Special investment dept. *	94,438,000	114,500,000
Total	228,310,000	598,009,000
Government—stocks	37,398, 000	71,035,000
Total	£265,708,000	£669,044,000
* Including estimated accrued interest		•

The trustee savings banks had to meet many problems arising from the impact of the war and, in addition, they gave sustained support to war bond sales. One of the most urgent of these problems arose from the sudden removal from home and employment of many depositors because of air attacks or home defense measures.

The Trustee Savings Bank association provided the means for such co-operation between the banks in meeting emergencies.

Immediately on the outbreak of World War II, a plan was put into effect by agreement between the National Debt commissioners, the post office, the joint state banks and the Trustee Savings Bank association, whereby depositors might, within certain limitations, transact banking business with their home banks, although situated in other localities.

The increase in deposits of trustee banks reflected the intensive drive made by these institutions in the financing of the war since deposits in the banks served the same national purposes as war issues. In England, all funds in the so-called ordinary accounts of trustee savings banks, constituting the bulk of their deposit liability, were turned over to the national debt commissioners for investment in government securities. Deposits in "special investment accounts," time deposits lodged for special investment, could be invested by the trustees of each bank only with the consent and under the control of the government. During the war, trustee banks participated successfully in the sales of savings bonds and certificates in collaboration with the post offices and savings groups by appealing to the small investor through various publicity and promotional devices.

Sweden.—In the autumn of 1945, the Swedish Savings Banks association commemorated the 125th anniversary of the savings bank movement in Stockholm. During the intervening years, savings banks had become an important part of the national economy in Sweden. In 1946, there were 463 banks varying in size from an institution with the equivalent of £20,000,000 to small parish banks with a few thousands of pounds to the credit of their depositors.

The institutions continued to be managed by boards of directors chosen by a larger body of headmen. These headmen, numbering about 30–50, were similar to the board of trustees and managers of the British trustee savings banks, except that one-third were nominated by the town council or other local authority. Of a savings bank's investments 30% were represented by national government or municipal loans.

Most of the banks' funds were invested in real estate mortgages owned by private individuals or public housing corporations.

(See also Business Review; Consumer Credit; Federal Reserve System; Law.)

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Bank of England

To the Bank of England's traditional functions as financial adviser to the government, bankers' bank and manager of the national debt, the establishment of the exchange equalization account by the Finance act (1932) had added a new and important duty concerned with the international value of sterling. When the United Kingdom was on the gold standard, the bank had a statutory duty to maintain exchange rates within very narrow limits of buying and selling gold at fixed prices. It was now charged with the day-to-day management of a government fund by which exchanges were not necessarily to be stabilized, but disorderly and violent fluctuations in rates were to be eliminated. The years of gathering storm preceding Sept. 1939 gave full opportunity for the exercise of the bank's new and developing technique.

In domestic affairs, the period preceding the outbreak of World War II was marked by a continuance of the cheap money policy inaugurated with the war loan conversion of 1932. The bank rate remained at 2% until Aug. 24, 1939, when it was raised to 4%; it returned to 3% on Sept. 28 and 2% on Oct. 26, at which level it still remained in 1946. Certain statutory changes of no fundamental importance to the constitution of the bank were made by the Currency and Bank Notes act (1939) which came into force on March 1, 1939. The limit of £260,000,ooo on the fiduciary issue of bank notes, set by the act of 1928, was raised to £300,000,000; the assets (including gold) of the issue department were henceforward to be valued weekly, any excess or deficiency in comparison with the total of notes being adjusted by transfers to or from the exchange equalization account; and the profits of the department were to be paid to the same account instead of being brought into the budget as miscellaneous revenue.

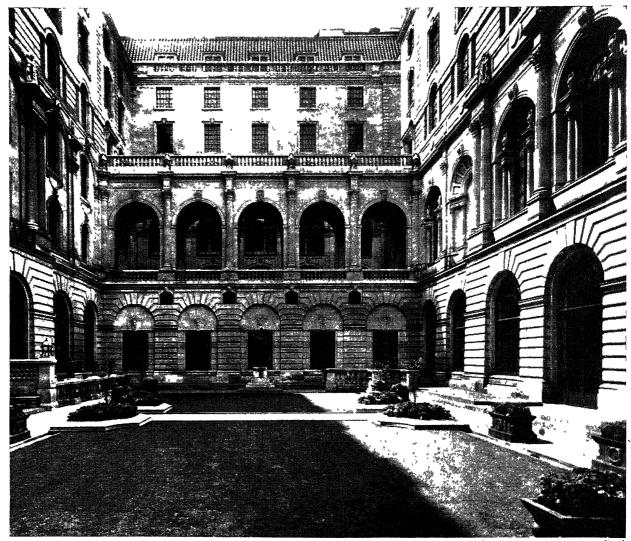
With the onset of war in Sept. 1939, the bank put into force plans which had been in preparation against such an eventuality. Apart from the raising of the bank rate, arrangements were made to provide additional currency if required and to protect the position of acceptors, on the lines of those improvised in Aug. 1914. World War II, however, had been so generally foreseen and the London market's commitments were so much less widely spread that virtually no recourse to them was necessary. Gold held in the issue department had fallen by £200,000,000 in Jan. 1939, on transfer to the exchange equalization account, of which £100,000,000 was restored in March, on the coming into force of the act referred to above. In Sept. 1939 most of the rest (£263,000,000) passed to the exchange equalization account, so that all resources were mobilized.

The effect of these movements can be seen in Table I, showing changes in the authorized limit of the fiduciary

Table I.—Bank of England: Fiduciary Note Issue
(Maximum authorized limit)

					(at mi	noni					
1936	Dec.	15	200	1941	April	30	680	1943	Dec.	7	1,100
1937	Nov.	13	220		Aug.	30	730	1944	March	7	1,150
1938	Jan.	13	200		Dec.	2	780		Aug.	1	1,200
	Dec.	6	230	1942	April	21	830		Dec.	4	1,250
1939	Jan.	6	400		July	28	880	1945	May	8	1,300
	March	1 1	300		Dec.	1	950		July	3	1,350
	Sept.	6	580	1943	April	13	1,000		Dec.	10	1,400
1940	June	11	630		Oct.	5	1,050	1946	Dec.	10	1,450

issue, but the most striking feature was the enormous increase that took place as the inevitable result of wartime conditions, including not only a higher level of prices and earnings, but also full employment and increased mobility of the population as a whole.



These changes in the note issue were, of course, one result of the need to finance the war on which the bank, in its traditional capacity as the banker of the government, had to concentrate. While "small savings" were the responsibility of the National Savings committee and the post office savings bank, the initiation and management of the main borrowing program fell on the bank. Two novel weapons were developed: first, the offer of government securities "on tap," instead of by periodical issues each open for a short time only; secondly, the institution of treasury deposit receipts whereby the additional deposits of the commercial banks accruing as a result of government expenditure were reborrowed for six months directly by the treasury. An incidental result of wartime finance was an enormous increase in the volume of government debt to be managed by the bank.

Table II.—Government Stocks and Bonds managed by the Bank*

		(æ	million			
At March 31 .	1937 1938 1939 1940	6,214 6,347 6,409 6,479	1941 1942 1943	7,250 8,690 9,897	1944 1945 1946	10,939 11,630 12,802

*Including local loans and certain other guaranteed issues.

This burden was not eased by the prudent removal of all this part of the bank's work to more peaceful but remote quarters in Hampshire. The success of the borrowing program may be judged not only by the continued decline in rates of interest but also by the relatively small extent to which it had to be accompanied by a direct increase

The Bank of England was among the first institutions nationalized in Great Britain after the Labour party came to power in 1945. Shareholders were bought out in accordance with the bill passed in the house of commons on Dec. 19, 1945. This picture shows one of the inner courtyards of the bank building on Threadneedle St., London

in central bank credit. A summary of the bank return during the ten-year period will be found in Table III. This success must be attributed in part to the close working of the bank with all parts of the capital market, which—built up over past years—proved its worth in the ready mobilization of the natural patriotism of all those concerned.

But the most novel and far-reaching of the bank's wartime activities was the institution and operation of a system of exchange control, designed to ensure that all available supplies of gold and foreign currency were conserved for use in the war effort. The bank acted as agents for the treasury, with which daily contact was maintained as also with other government departments such as those responsible for the licensing of imports and exports. Gold and certain specified currencies had to be surrendered, and dealings were canalized through the bank or through other banks constituted as authorized dealers. Arrangements were made for calling in U.S. dollar and certain other securities; and dealings in other foreign securities had to be controlled. The bank entered into a series of agreements with central banks, for example, in South

America, covering the financing of essential wartime trade; agreements the smooth functioning of which owed a good deal to the collaboration established before the war. This co-operation particularly proved its worth in connection with what came to be known officially as the "sterling area." For decades the trade of most empire and some allied countries had been financed in sterling through London, where they were wont to keep at least a large part of their monetary reserves. On this traditional foundation was built a structure of exchange controls in these countries, acting substantially in line with that in the United Kingdom; so that within the fence thus created, trade and payments could be left untrammelled, but the allied countries in the sterling area could pool their resources of gold and scarce currencies for the common effort.

Nationalization.—For a century the bank had accepted the responsibilities of a central bank. Montagu Norman (later Lord Norman), whose governorship almost spanned the period between the end of World War I and the end of World War II, had created a new organization with a new outlook, fitted for the specific functions of a modern central bank, and this new organization was available when in 1931 the government of the United Kingdom suspended the gold standard.

In Oct. 1945 a bill was introduced into the house of commons to bring the capital stock of the Bank of England into public ownership and bring the bank under public control-"the first of the government's nationalization measures." It was passed on Feb. 14, 1946, and came into force on March 1, 1946. While the measure was the application of a general political principle to a particular case, the government was at pains to make the application with the least possible disturbance of existing practice, and to make it clear that this was its intention. The bill, said the chancellor of the exchequer, "in effect, brings the law into relation with the facts as they have gradually evolved over the years. . . . By this bill we ensure a smooth and efficient growth of our political and banking system, in order to meet the new needs of the future. . . . In one aspect, this bill only legalizes an actual situation." He went on to point out that "the relations between the Bank of England and the treasury have long been close, confidential, even intimate; and so they must continue."

The first clause provided for the transfer of the capital stock of the bank to a nominee of the treasury, and compensated the previous proprietors by an amount of government 3% stock which would yield them the same gross income as their dividends on bank stock had brought them annually in the previous 20 years. The second provided for the appointment of governor, deputy governor and directors by the crown; the number of directors was reduced from 24 to 16. Power was taken to revoke any or all of the provisions of the bank's charters "except in so

far as they incorporate the bank," and after the passing of the act a new charter was in fact granted, of a purely formal character. The only serious controversy arose over clause 4 of the bill, which (a) empowered the treasury to "give such directions to the bank as, after consultation with the governor of the bank, they think necessary in the public interest"; and (b) empowered the bank to request information from, and make recommendations to, bankers and, "if so authorized by the treasury, issue directions to any banker for the purpose of securing that effect is given to any such request or recommendation." The fears of critics were met by the provisos that (a) "no such request or recommendations shall be made with respect to the affairs of any particular customer of a banker"; and (b) "before authorizing the issue of any such directions the treasury shall give the bankers concerned . . . an opportunity of making representations with respect thereto."

Subject to any treasury directions, the affairs of the bank were to be managed by the court of directors in accordance with the provisions of its charters, and the chancellor expressly disclaimed any intention to interfere with the day-to-day administration of the bank's business.

A measure which transferred to the government of the day the power to appoint the governors and directors of the central bank had obvious potentialities of changed policies and changed relations; but within the limiting conditions of a measure to nationalize the bank, the government took reasonable precautions to safeguard the independence so essential in an institution on which it relied both for technical advice in the field of finance and the technical implementation of its credit policy. Its character as a self-governing and independently functioning corporation was preserved. While the power was explicitly taken to issue directions to the bank-a power which a government might well have exercised without specific legislation-the government spontaneously restricted itself to issuing such direction only "after consultation with the governor of the bank," which safeguarded his right and opportunity to offer independent advice. Again, the position of the bank as the channel by which the government would communicate with the other banks was safeguarded, and indeed strengthened. By implication the change in the position and functions of the bank and its organization for sustaining them was approved and confirmed; but the responsibility of the government of the day for the broad decisions of monetary and credit policy was formally affirmed, and the duty of the bank to respect the government's authority, instead of remaining a matter of convention, was ensured by a new constitution.

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Table III.—Bank of England weekly returns Averages of Wednesday figures (£ million)

Issue dept.	1937	1938	1939	1940	1941	1942	1943	1944		1946 (weekly av. Jan. to Oct.)
Notes in circulation	479.6 44.5	485.6 43.9	507.3 40.6	<i>574.7</i> 33.4	652.2 33.7	808.3 36.4	966.3 36.8	1135 <i>.7</i> 30.9	1284.2 26.6	1,352.8 47.4
Government securities	202.6	203.0	403.6	607.9	685.7	844.4	1002.8	1166.3	1310.6	∫1,399.2 .8
Gold coin and bullion	321.4	326.4	*	.2	.2	.2	.2	.2	.2	.2
Banking dept. Deposits: public	19.5 97.2 37.2 98.4 6.9 21.2	18.2 106.2 36.2 103.2 9.6 21.0	21.3 102.5 38.0 107.0 8.5 22.9	27.3 110.3 47.4 141.4 4.2 22.9	16.7 122.6 52.9 144.4 9.6 21.2	10.8 136.9 49.8 150.3 5.4 22.4	8.7 158.9 55.8 179.8 4.4 19.1	9.9 184.4 56.2 214.0 6.0 16.3	12.8 217.9 55.1 251.8 9.2 15.0	12.6 250.1 55.0 254.5 14.7 18.4
Reserve of notes and coin	45.5	44.9	41.5	34.4	35.0	37.3	38.0	32.1	27.6	48.5

the United Kingdom. (London, 1941); Sir John H. Clapham, The Bank of England. A History (1694–1914) (London, 1944); R. G. W. Saw, The Bank of England 1694–1944, and its Buildings past and present (London, 1944); Thomas Balogh, Studies in Financial Organization. (H. Cy.)

Bankruptcy

See Law; Securities and Exchange Commission.

Banks

See BANKING.

Baptist Church

A significant step was taken by many bodies within the Baptist World Communion by their decision to have representation in the Conference on Church, Community and State, at Oxford, 1937; the Conference on Faith and Order at Edinburgh, 1937 and the Utrecht Provisional conference on a World Council of Churches in 1938. At the Lausanne Conference on Faith and Order in 1927, the Northern Baptist convention (U.S.A.) and the Baptist Convention of Ontario and Quebec had delegates. In the later conferences the Southern Baptist convention (U.S.A.), the National Baptist convention (Negro, U.S.A.) and the Baptist Union of Great Britain and Ireland were also represented.

Baptists of Australia, South Africa and New Zealand found distance and expense too great for delegations. At the end of the decade 1937–46, the Southern Baptist convention had not yet decided to join the World Council of Churches, which had its inception in the Utrecht Provisional conference.

In July 1939, the sixth congress of the Baptist World Alliance was held at Atlanta, Georgia, with 12,000 registered delegates present. The executive committee of the Alliance meeting in Washington, D.C. in May 1946, decided to hold the seventh congress in Copenhagen, Denmark, in July 1947.

War engaged the attention of Baptists from 1939 to 1945. The American conventions could not be held, because of government restrictions, in 1943 or 1945. A markedly different attitude from that toward World War I was noticeable. Concerning World War II there were confessions of guilt, a sense of failure to have exercised fully the power of Christ throughout the world in ways of peace.

Although full support was pledged by the various conventions and unions to their respective governments in the prosecution of the war, the rights of conscientious objectors were defended and funds were apportioned for their support.

In spite also of extra burdens borne through the war years as citizens, Baptists in all lands extended their religious activities. Early in 1942 Australian Baptists forwarded well over \$1,000 and a large collection of clothing to the relief of their sister churches bombed in the British Isles and increased their missionary funds for advance in India and at home. In the following years, 1942-46, additional large donations were made to these causes.

The Baptist Union of Great Britain and Ireland, burdened with the expense of repairing their own church edifices, enlarged their missionary benevolences. In 1942, one of the worst years of England's blitz, the Ter-Jubilee of the Baptist Missionary society (organized to send William Carey to India, in 1792) was celebrated in London at

which time a commemoration fund of more than \$600.000 was raised. Again a self-denial week (Oct. 28-Nov. 4, 1945) was set apart for special gifts. A Victory Thanksgiving fund of some \$600,000 was endorsed for 1946—\$400,000 for local work and \$200,000 for reconstruction on the continent.

Because of financial strictures Canadian Baptists were compelled in 1938 to relinquish control of their Brandon college organized in 1898 at Brandon, Manitoba. Although its management passed into the hands of a local board, having affiliations with the University of Manitoba, Dr. J. R. C. Evans, a Baptist, remained as president.

In Dec. 1944 the Baptist Federation of Canada was formed, co-ordinating the three conventions, Maritime, Ontario and Quebec and the Union of Western Canada.

All Canadian Baptists took pride in the fact that the Riverside church of New York city, seeking a successor to their well-beloved and famous pastor, Dr. Harry Emerson Fosdick, extended a call on March 27, 1946, to Professor Robert James McCracken of McMaster university, Hamilton, Ontario, who accepted.

The Northern Baptist convention (U.S.A.) in 1942 added an emergency fund of \$600,000 to their normal budget of \$2,500,000, which total was exceeded by \$133,795. In 1944 the emergency fund was raised to \$2,000,000 and the annual budget to \$5,000,000. In 1945 the World Mission Crusade of \$14,000,000 was adopted for completion by April 30, 1947. The sum was set aside for missionary enterprises at home and abroad, the restoration of church buildings, schools and hospitals, extension of urban work, education and pension funds for ministers and missionaries. The grand total, with the annual budget, amounted to \$17,900,000.

The convention sessions, held at Grand Rapids, Mich., in May 1946, were attended by more than 5,000 delegates -the largest in its history of nearly 40 years. Encouraging achievements in missions were reported. Twenty-five missionaries were appointed in 1945-46 to home mission fields. Eighteen new missionaries were commissioned to the foreign field by the Conservative Baptist Foreign Mission society. The American Baptist, and Woman's, Foreign Mission societies expected to appoint 37 families and 20 single women to 10 fields in 1946. In April 1946, a cablegram was received by the American Baptist Foreign Mission society reporting that Shanghai university, China, maintained co-operatively by Northern and Southern Baptists, had returned with 900 students to its campus in Shanghai on Easter Sunday. The university had been forced into western areas of China at the outbreak of the war with Japan.

The Southern Baptist convention meeting in Miami, Fla., in May 1946, was attended by 7,800 messengers. In 1945 Southern Baptists contributed to all causes the large sum of \$98,500,000. The Woman's Missionary union raised \$6,517,322 for missions and education. Enthusiastically the convention voted to raise an extra \$3,500,000 for relief and rehabilitation in Asia and Europe by Sept. 30, 1946, of which amount \$17,000 was received during the sessions. It was recommended that the convention should "study the whole race situation" and a resolution was passed urging "the members of the churches of the convention to refrain from association with all groups that exist for the purpose of fomenting strife and division within the nation on the basis of differences of race, religion and culture."

The Scottish Baptists in 1944 raised a total of more than \$46,000 for foreign missions, an increase of more than \$5,000. In 1945 they supported more than 50 mis-

sionaries with 39 in active service and others awaiting passage.

For the year 1945-46 the Baptists of South Africa sought a Thanksgiving fund of more than \$60,000 for extension work among the English-speaking people rapidly moving into the frontier areas.

Dr. J. H. Rushbrooke, president of the Baptist World alliance, reported that in 1946 the Baptists of Britain were able to finance their own program for the first time after 1939. More Baptist church buildings were destroyed during World War II in Great Britain than were demolished in all of continental Europe. Though the war hindered the work of the alliance, the range of its contacts was enlarged. Baptists in invaded countries, such as Norway and The Netherlands, stood firm in their faith, their number actually increasing in Denmark. The seminary in Czechoslovakia, closed during the war, reopened. In Rumania, Baptists were recognized as a Christian communion with freedom of worship. Even in the U.S.S.R. conditions were encouraging.

World statistics for Baptists in 1941 (latest data available at the end of the decade) were as follows: Europe, 657,111; Asia, 585,810; Africa, 135,841; America, (North), 11,417,963; (Central and West Indies), 76,124; (South), 73,274; Australia and New Zealand, 40,774; total 12,986, 897. The 1946 total exceeded 13,000,000.

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(R. E. E. H.)

Bar Association, American

See Societies and Associations.

Barbados

*Exports.

See WEST INDIES, BRITISH.

Barium Minerals

While direct consumption of barium minerals in the war program had little effect on demand, certain indirect uses contributing to the war effort made marked changes. There was a moderate increase in demand for barium chemicals, and a small increase in pigment uses, but the chief repercussion came from the petroleum industry, which greatly increased the amount of barite used in drilling mud. As the accompanying world production table shows, total output was little affected, but there were

World Production of Barite

	(I housands of short fons)								
	1937	1938	1939	1940	1941	1942	1943	1944	1945
Canada .			0.3	0.3	6.9	19.7		118.7	
Cuba	4.2		13.2	17.8	14.6	4.2	3.5	* 5.31	٠
France	21.9			2.5	5.0	10.5	6.2	2.8	
Germany.	498.6	530.0	463.3	376.8	380.0	3 75 .	380	370	
Greece	43.4	38.2	26.5		• • •	• • •	• • •	• • •	
India	17.6	9.0	10.5	21.0	26.3	12.6	9.9		
Italy	49.8	53.1	59.4	35.1	28.7	41.5		• • •	• • •
United Kingdom	82.1	85.5	106.2	29.0	113.6	110.5	113.1	110.7	•••
United States	360.9	335.4	365:9	390.5	483.4	449.9	429.3	515.1	692.3
Total	1,100.0		1,100.0	1,040.0	1,100.0	1,100.0	•••	•••	•••

heavy shifts in production. When Germany was cut off from export markets, production there declined to a fairly uniform level for home consumption. To offset the loss of the German exports, production increased elsewhere, especially in the United States, Canada and Great Britain.

In the United States production of barite rose from 360,877 short tons in 1937 to 692,330 tons in 1945, of which 407,871 was used in well-drilling as compared with 126,697 tons used for this purpose in 1938 (1937 figures not reported); the 284,459 tons left available for other uses in 1945 was an increase of only about 20% over the prewar level. U.S. imports, mainly crude barite, but including a few thousand tons each of ground barite, witherite and barium chemicals, totalling 79,411 tons in 1937. had declined to 660 tons in 1943, but recovered to 57,826 tons in 1945. The only barium product in which the United States had an appreciable export trade was lithopone, which expanded from 2,671 tons in 1937 to 21,527 tons in 1941, but declined to 11,576 tons in 1945.

Outside the United States, the most spectacular increase in barite output was in Canada, where a first production of 338 tons in 1940 grew to 140,198 tons in 1945, mostly from Nova Scotia.

The British output, including both barite and witherite, showed only a moderate increase. Witherite (barium carbonate) was commercially produced only in England.

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Barkley, Alben William

Barkley (1877—), U.S. senator, was born Nov. 24, 1877, in Graves county, Ky., the son of a tobacco farmer. He was graduated in 1897 from Marvin college at Clinton, Ky., with a B.A. degree, later studying at Emory college in Georgia and the University of Virginia law school. Elected to the U.S. house of representatives in 1912, he was re-elected six successive times. In 1926, he was elected to the senate and was re-elected in 1932, 1938 and 1944.

A loyal administration supporter, Barkley was instrumental in getting the support of his senatorial colleagues for the Selective Service and Lend-Lease bills and also sponsored the amendments to the Neutrality act which passed the senate in Nov. 1941. In 1944 he broke his record of 11 years of uninterrupted support of the New Deal and charged (Feb. 23) that President Roosevelt's veto message on the tax bill was "a deliberate assault" upon the integrity of congress. After delivering this angry protest, Barkley resigned as leader of the senate. Roosevelt hastily disavowed any intention of slurring the integrity of congress and urged Barkley to reconsider his resignation. Both houses of congress overrode the president's veto, and on Feb. 24, Barkley was unanimously reelected to senate leadership by a Democratic senate caucus.

When congress decided to investigate the Pearl Harbor incident, Barkley was named (Sept. 18, 1945) chairman of the committee of inquiry. The committee published its conclusions on July 20, 1946, and Barkley signed the majority report which asserted that Roosevelt and his three principal cabinet members at the time—Cordell Hull, Henry Stimson and Frank Knox—did not "incite" or "cajole" Japan into attacking Pearl Harbor. In 1946 Sen. Barkley was one of the principal administration supporters who helped get congressional approval of the U.S. loan of \$3,750,000,000 to Britain.

Barley

World barley production was about 2,332,000,000 bu. in the prewar decade, and some increase was reported during the following years. After the outbreak of World War II, barley production was increased in the United Kingdom by plowing pasture lands. In Canada, barley was sown in place of wheat when the latter was in surplus supply at the beginning of the war. Canadian production in 1942 was 259,000,000 bu. compared with 110,000,000 bu. in 1941, and an average of 88,000,000 bu. in 1935-39. Before the war, Germany was the principal barley producer of Europe, followed by Spain and Poland. Turkey, India, Japan and China were also important producers.

Production of barley in the United States increased steadily from a low point of 117,390,000 bu. in 1934 to a record crop of 429,167,000 bu. produced in 1942. Thereafter the acreage and production declined, and the 1945 crop of 263,961,000 bu. was the smallest after 1938. The inability of barley to compete with other crops brought the decline, though prices were double those of prewar. Reduced acreage accounted for the shrinkage in the crop: yields in 1945 were the highest after 1915 and above the ten-year average of 22.3 bu. per acre.

U.S. Barley Production by Leading States, 1937-46

	(In m	illions of	bushels)			
1 <i>937</i>	1939	1941	1942	1943	1944	1945	1946*
1937 U.S. Total 221.8 California 29.3 North Dakota 21.1 South Dakota 19.6 Minnesota 50.2 Montana 2.0 Colorado 8.8 Nebraska 9.9 Idaho 4.0 Oregon 4.4 Utah 3.1 Kansas 3.4 Michigan 4.8 Washington 2.1 Wisconsin 22.0 Visconsin 22.0 Texas 1.7	1939				1944 278.5 40.0 57.2 28.4 13.8 16.2 13.6 8.9 12.7 7.1 14.1 7.0 3.9 7.5 5.0	1945 266.8 41.6 52.5 31.8 12.9 14.7 22.5 13.4 11.3 7.5 5.8 7.0 3.6 4.3 3.6	263.3 46.0 46.6 30.2 21.2 18.0 13.9 11.5 9.3 9.4 4.8 5.0 5.0 3.3 4.6
Pennsylvania 1.9 Myoming 1.8 New York 3.0 Arizona .7 Maryland 1.0 Virginia 1.3 Tennessee .6 Oklahoma 2.2 Kentucky .8 Missouri 2.5	.6 2.0 .1 1.0 1.9 .2 1.0 8.4 .8 3.8	3.7 2.5 2.9 1.4 2.0 1.8 1.6 9.2 2.3 3.1	4.0 2.6 3.3 1.8 2.3 2.1 2.2 10.6 3 1 3.0	2.7 3.2 2.3 1.6 1.7 1.5 1.8 3.7 2.0 2.1	2.6 3.2 2.3 2.8 2.1 2.1 1.8 3.9 1.9	3.8 3.7 2.5 2.6 1.8 1.7 2.9 1.2	3.9 3.6 2.9 2.1 2.2 1.6 1.8 1.2

The larger part of the U.S. barley crop continued to be used as livestock feed, while next came the making of malt for alcoholic beverages. Barley prices remained fairly steady through the decade 1937-46 until 1943, when an increase of more than 50% was recorded. Barley prices rose nearer to those of corn, and in the spring of 1946 the two were exactly the same, \$1.16 per bushel. The production of barley was giving way to oats in the U.S. corn belt, since improved varieties of the latter grain were giving better returns. In the central states, corn and oats were crowding out barley, although the latter was still a more reliable crop than corn in the northern plains.

*Preliminary Estimate.

Barley became an export crop about 1891, and the U.S. continued to have a balance of exports until 1934 ranging from 5% to 12% of the annual crop. One exceptional high point was in 1919, when exports amounted to 25% of the rather small crop of that year. In 1937, net exports amounted to 5.4% of the crop of 220,327,000 bu. U.S. needs for feed increased thereafter; net imports for 1942 were 25,067,000 bu. and for 1945, 38,002,000 bu., principally from Canada.

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Barros Camara, João de

), Brazilian prelate, was Cardinal Barros (1894born Aug. 3, 1894 at São José, state of Santa Catarina, Brazil. Educated at the Jesuit seminary of São Leopoldo, he was ordained in Jan. 1920, served as rector of the diocesan seminary and was made bishop of Mossoro in 1935. Consecrated archbishop of Belem do Pará in 1940, he was transferred to the see of São Sebastião do Rio de Janeiro in 1943. The archbishop, regarded as an able organizer, orator, historian and administrator, was active in developing seminaries and charitable works. He also engaged in extensive research in the history of the Roman Catholic Church in Brazil. His appointment to the Sacred College of Cardinals was announced Dec. 23, 1945. The Archbishop was proclaimed a cardinal at a consistory in Rome on Feb. 18, 1946.

Baruch, Bernard Mannes

Baruch, (1870-), U.S. financier and government official, was born Aug. 19, 1870, in Camden, S.C., the son of a Confederate surgeon. He moved to New York city at the age of 12, and later attended City college of New York. Interested in finance, he became successively a customer's man and speculator in Wall street, amassing by the time he was 42 years old a fortune estimated at between \$12,000,000 and \$15,000,000.

In 1916 he went to Washington, D.C., at President Woodrow Wilson's behest to become a civilian member of the Advisory Commission of the Council of National Defense. Made head of the War Industries board in March 1918, Baruch was given virtually dictatorial authority over U.S. war production. He left his post in Jan. 1919, and went with President Wilson to the Versailles conference in the capacity of economic adviser.

Between wars, Baruch resumed his financial operations but after the outbreak of World War II he headed a committee investigating the rubber crisis. He returned to government service in June 1943 as adviser on industrial production to the personal staff of James Byrnes, then OWM director, serving without title or salary. On Sept. 17, 1943, Baruch recommended a labour pool to meet the man power crisis. Byrnes later named Baruch to head a new unit established within the OWM to deal with adjustments in war production and postwar reconversion.

After the collapse of Germany, Baruch recommended that German industry be dismembered and that the Germans be permitted to produce only essentials for their own use. Baruch was named by President Truman as U.S. delegate on the United Nations Atomic Energy commission on March 18, 1946. Three months later he submitted (June 14) to the latter body the U.S. proposal for international control of atomic energy. The plan was criticized by left wing and liberal elements in the United States, particularly by Secretary Henry Wallace, who asserted that the U.S. desired to dictate the steps leading to international control of atomic energy. Baruch charged on Oct. 2, 1946, that Wallace's statement to President Truman on the subject not only contained five errors of fact but that his interpretation of the Baruch plan could seriously impair its support by U.S. public opinion.

Basalt

See STONE.

Baseball

Organized baseball's seventh decade of history, which coincided almost exactly with the eventful years of 1937 to 1946, furnished its followers with the most exciting parade of moments that the great game had ever known. In baseball, as in world affairs, it was an era featured by revolutionary happenings, unexpected sensations and grim tragedies.

Despite the obviously necessary curtailment caused by World War II, baseball emerged from the period with a record-shattering attendance, a strong system of minor leagues to feed talent to the major circuits and a host of promising players.

It was the era in which Johnny Vander Meer, Cincinnati's proud young southpaw, spun his two consecutive no-hit games, an unparallelled feat. It saw also the final dissolution of the 2,130 consecutive game string played by Henry Louis Gehrig, and later the untimely death of that great player. It witnessed the tremendous growth in popularity of baseball played at night; the setting aside of Cooperstown, N.Y., as the pastime's shrine; the signing of Negro players to end at long last the game's unwritten policy of Jim Crowism; the 56-game batting streak of the Yankee Clipper, Joseph Paul DiMaggio; the first playoff to decide a pennant in 71 years of major league history; and numerous other events touched with

It is axiomatic that baseball provides rapid changes, and no better indication of this condition can be given than to cite the managerial structure of the game at the beginning of the era and at its close.

Managers.—At the start of the 1937 season, the 16 major league clubs took the field guided by the following managers:

National League Boston-William B. McKechnie Boston-Joseph E. Cronin Brooklyn-Burleigh A. Grimes Chicago-Charles J. Grimm Cincinnati-Charles W. Dres-New York-William H. Terry

Philadelphia-James Wilson Pittsburgh-Harold J. Traynor St. Louis-Rogers Hornsby St. Louis-Frank F. Frisch

American League Chicago-James J. Dykes Cleveland-Stephen F. O'Neill Detroit-Gordon S. Cochrane New York-Joseph V. McCar-

thy Philadelphia-Connie Mack Washington—Stanley R. Harris

Of these 16 managers, only two—the patriarchal Connie Mack and Joseph E. Cronin-remained at the head of their clubs throughout the decade. Mack, of course, an owner of the Philadelphia franchise, was as solidly entrenched there as the Liberty Bell. Once winner of the Bok award for outstanding service to Philadelphia, Mack had piloted the destinies of the club ever since the founding of the American league.

A third man, Charles J. Grimm, was the manager of the Chicago Cubs at the end of the era, just as he was at the start. But his service with the club had been interrupted by managerial reigns of Charles L. Hartnett and James Wilson.

For the others, the fates had all sorts of things in store. Burleigh Grimes served just two seasons with Brooklyn, and then remained in the game to boss various minor league clubs. His place at Brooklyn was taken by Leo Durocher, a fiery, latter-day John J. McGraw, who brought to the proud borough of Brooklyn the days of its greatest grandeur.

Bill McKechnie moved to Cincinnati in 1938, and moulded championship clubs in 1939 and 1940. Then a decline set in, and in Sept. 1946 he announced his retirement, moving to Cleveland to serve as coach in 1947 under Manager Lou Boudreau. McKechnie's place was taken at Cincinnati by John Neun, famed as one of seven men in all baseball history to execute an unassisted triple

Dressen, Cincinnati manager in 1937, moved on to Brooklyn, where he served as an aide to Durocher.

Terry, Traynor, Cochrane and Hornsby-four of the most glowing names in the annals of the pastime, left the game entirely. Terry was succeeded at New York by Melvin Thomas Ott, whose playing career with the Giants extended over two decades. Traynor, succeede at Pittsburgh in 1940 by Frank Frisch, retired to do sports work on the radio. Cochrane brought Detroit a pennant in 1934 and a world's championship in 1935, but gave way in 1938 to Del Baker, who in turn yielded to Steve O'Neill. Hornsby, long a stormy petrel in the game's affairs, left the Browns early in 1937. His departure was the signal for a succession of Brown managers: Jim Bottomley, Charles "Gabby" Street, Fred Haney and Luke Sewell. Under Sewell the Browns in 1944 achieved their first and only championship.

Wilson, manager of the Phils in 1937, tasted almost every sort of fortune in the years that followed. He moved to Cincinnati as a coach under McKechnie in 1939, and when a series of circumstances made it necessary he resumed his career as an active player, going behind the bat in the world series of 1940. His striking performance in that role, made under the most difficult of circumstances, won for him the job of managing the Chicago Cubs. For three years and part of a fourth Wilson remained in Chicago. Then he resigned and resumed his coaching chores for the Reds.

Dykes remained at Chicago for most of the decade, leaving in 1946 to pilot the Hollywood club of the Pacific Coast league. Harris, succeeded in Washington by Ossie Bluege in 1943, served a brief and tumultuous hitch as pilot of the Phillies, and finally joined the New York Yankees in 1946 in an executive capacity.

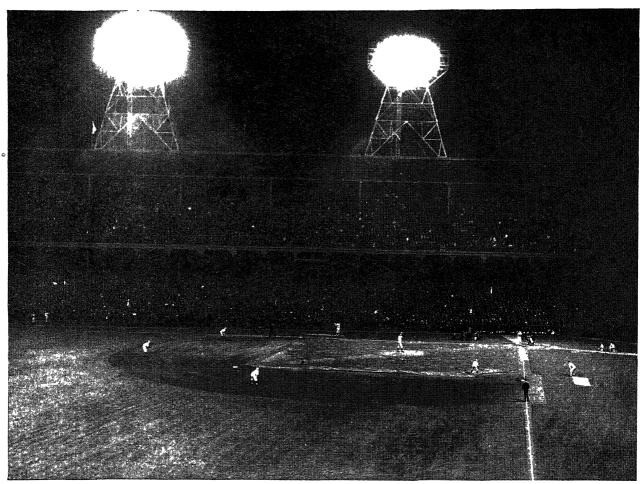
But perhaps the most brilliant record of the decade was set by a manager who was not even in the majors when 1937 started. That man, William H. Southworth, won three successive pennants for the St. Louis Cardinals in 1942, 1943 and 1944. Then, after finishing second at St. Louis in 1945, he moved on to Boston, where he raised the once hapless Braves from sixth to fourth place.

The peregrinations recorded above testify to the ephemeral character of baseball's structure, but even more startling were the numerous changes in club ownership which brought new capital and new hopes to the thousands of fans in the cities affected. No less than seven major league clubs changed hands during the period, as follows:

The New York Yankees, who achieved fabulous success under the ownership of Colonel Jacob Ruppert and the guidance of Edward G. Barrow, were sold to a syndicate headed by Leland S. "Larry" MacPhail, former general manager at Cincinnati and Brooklyn; Dan Topping, wellknown sportsman; and Del Webb, former player and businessman. MacPhail, who used startling methods to jack up attendance at Cincinnati and Brooklyn, pursued the same policies at New York and was rewarded in 1946 with the largest attendance ever recorded by a club.

After winning a pennant in 1944, Donald L. Barnes, president of the St. Louis Browns, announced the sale of his stock to Richard C. Muckerman, who became president.

Alva Bradley, president at Cleveland after 1928, sold out



John Vander Meer of Cincinnati pitched his second successive nohit game—a world's record—at Brooklyn on June 15, 1938. This game was the first night contest played in Brooklyn

to a syndicate headed by William Veeck, son of the former president of the Chicago Cubs and a showman of the MacPhail pattern. Veeck assumed the reins in mid-season, 1946, and almost immediately obtained results.

Pittsburgh, which for 47 years had been owned by the Dreyfuss family, changed hands in 1946, with Frank E. McKinney, an Indianapolis banker, succeeding William E. Banswanger as president. The sale of the Cleveland and Pittsburgh clubs brought two well-known theatrical names into the baseball scene. Singer Harry "Bing" Crosby was associated with the group which took over the Pittsburgh franchise, and comedian Bob Hope was among those who invested with Veeck at Cleveland.

The Philadelphia Phils went through two changes of ownership. Gerald Nugent, president for ten years, sold out in 1943 to William D. Cox; and before the year was out the club was acquired by youthful Robert R. M. Carpenter, Jr., whose investments merited the team's improvement. The Phillies emerged from the league basement in 1946 to finish fifth, the highest vantage point they had succeeded in reaching since 1932.

The Boston Braves, for ten years piloted by Robert Quinn and his son, John, were purchased by a group headed by Louis R. Perini, Guido L. Rugo and Joseph Maney. Perini, as president, pulled a master stroke in securing William H. Southworth as manager of the club.

Branch Rickey, who served the game in almost every possible capacity, moved from the St. Louis front office to take over as Brooklyn president in 1943.

As far as what actually took place on the diamond was concerned, the era was featured by the tremendous strength of the Brooklyn and St. Louis teams in the National league, and the continued dominance of the American by the New York Yankees. The table below shows the pennant winners in each league for the years considered:

	National	League	:	•	American i	League:	
Year	Champion	Won	Lost	Pct.	Champion	W. L.	Pct.
1937	New York	95	57	.625	*New York		
1938	Chicago	89	63	.586	*New York	99 53	_
1939	Cincinnati	97	57	.630	*New York	106 45	.702
1940	*Cincinnati	100	53	.654	Detroit	90 64	
1941	Brooklyn	100	54	.649	*New York	101 53	.656
1942	*St. Louis	106	48 '	.688	New York	103 51	.669
1943	St. Louis	105	49	.682	*New York	98 56	.636
1944	*St. Louis	105	49	.682	St. Louis	89 65	.578
1945	Chicago	98	56	.636	*Detroit	88 65	•575
1946	*†St. Louis	98	58	.628	Boston	104 50	.675

*World Series winner and world champion. †Victors over Brooklyn in National league playoff.

World Series Play.—Baseball interest reaches its apex annually at the time of the world series. Since 1903 (officially since 1905) the champion teams of the National and American leagues contended in a series of games to determine the champions of the world. This annual classic has long been celebrated as the crowning event of the sporting world, and as it continues each year its traditions grow. Here, in essence, are the results of the world series from 1937 through 1946.

New York Giants vs. New York Yankees

(Yankees winners, 4 games to 1)	7044		
DATE WINNERS LOSERS PLACE WINNING PITCHER	St. Louis Cardinals vs. St. Louis Browns (Cardinals winners, 4 games to 2)		
Oct. 6-Yankees 8 Giants 1 Yankee Stadium Gomez Oct. 7-Yankees 8 Giants 1 Yankee Stadium Ruffing	DATE WINNERS LOSERS HOME CLUB WINNING PITCHER		
Oct. 8–Yankees 5 Giants 1 Polo Grounds Pearson Oct. 9–Giants 7 Yankees 3 Polo Grounds Hubbell Oct. 10–Yankees 4 Giants 2 Polo Grounds Gomez	Oct. 4 Browns 2 Cardinals 1 Cardinals Galehouse Oct. 5 Cardinals 3 Browns 2 Cardinals Donnelly Oct. 6 Browns 6 Cardinals 2 Browns Kramer Oct. 7 Cardinals 5 Browns 1 Browns Brecheen Oct. 8 Cardinals 2 Browns 0 Browns M. Cooper		
1938 Chicago Cubs vs. New York Yankees (Yankees won four straight victories)	Oct. 9 Cardinals 3 Browns 1 Cardinals Lanier		
DATE WINNERS LOSERS PLACE WINNING PITCHER	Chicago Cubs vs. Detroit Tigers (Tigers winners, 4 games to 3)		
Oct. 5 Yankees 3 Cubs 1 Chicago Ruffing Oct. 6 Yankees 6 Cubs 3 Chicago Gomez Oct. 8 Yankees 5 Cubs 2 New York Pearson	DATE WINNERS LOSERS PLACE WINNING PITCHER Oct. 3 Cubs 9 Tigers o Detroit Borowy		
Oct. 9 Yankees 8 Cubs 3 New York Ruffing	Oct. 4 Tigers 4 Cubs 1 Detroit Trucks Oct. 5 Cubs 3 Tigers 0 Detroit Passeau		
1939 Cincinnati Reds vs. New York Yankees (Yankees won four straight games)	Oct. 6 Tigers 4 Cubs 1 Chicago Trout Oct. 7 Tigers 8 Cubs 4 Chicago Newhouser Oct. 8 Cubs 8 Tigers 7 Chicago Borowy		
DATE WINNERS LOSERS PLACE WINNING PITCHER	Oct. 10 Tigers 9 Cubs 3 Chicago Newhouser		
Oct. 4 Yankees 2 Reds 1 New York Ruffing Oct. 5 Yankees 4 Reds 0 New York Pearson Oct. 7 Yankees 7 Reds 3 Cincinnati Hadley	St. Louis Cardinals vs. Boston Red Sox (Cardinals winners, 4 games to 3) DATE WINNERS LOSERS PLACE WINNING		
Oct. 8 Yankees 7* Reds 4 Cincinnati Murphy *Ten innings	DATE WINNERS LOSERS PLACE WINNING PITCHER Oct. 6 Red Sox 3* Cardinals 2 St. Louis Johnson		
1940 Cincinnati Reds vs. Detroit Tigers	Oct. 7 Cardinals 3 Red Sox o St. Louis Brecheen Oct. 9 Red Sox 4 Cardinals o Boston Ferriss Oct. 10 Cardinals 12 Red Sox 3 Boston Munger		
(Reds winners, 4 games to 3) DATE WINNERS LOSERS PLACE WINNING	Oct. 11 Red Sox 6 Gardinals 3 Boston Dobson Oct. 13 Cardinals 4 Red Sox 1 St. Louis Brecheen		
Oct. 2 Tigers 7 Reds 2 Cincinnati Newsom Oct. 3 Reds 5 Tigers 3 Cincinnati Walters	Oct. 15 Cardinals 4 Red Sox 3 St. Louis Brecheen *Ten innings		
Oct. 4 Tigers 7 Reds 4 Detroit Bridges Oct. 5 Reds 5 Tigers 2 Detroit Derringer	All-Star Games.—Another feature of major league play which came to be looked upon with as much interest as		
Oct. 6 Tigers 8 Reds o Detroit Newsom Oct. 7 Reds 4 Tigers o Cincinnati Walters Oct. 8 Reds 2 Tigers 1 Cincinnati Derringer	the world series was the annual game between all-star players of the National and American leagues. The first		
1941	of these games took place on July 6, 1933, at Comiskey Park, Chicago, with the proceeds going to the Association		
Brooklyn Dodgers vs. New York Yankees (Yankees winners, four games to 1)	of Professional Ballplayers of America, and was staged as an extra attraction of the Chicago world's fair. After that		
DATE WINNERS LOSERS PLACE WINNING PITCHER Oct. 1 Yankees 3 Dodgers 2 New York Ruffing	the games were held annually, with the exception that the 13th game, scheduled for Fenway Park, Boston, in 1945, was cancelled because of transportation problems.		
Oct. 2 Dodgers 3 Yankees 2 New York Wyatt Oct. 4 Yankees 2 Dodgers 1 Brooklyn Russo	The scores, together with other pertinent data, on the All-Star contests from 1937 through 1946, were as follows:		
Oct. 5 Yankees 7 Dodgers 4 Brooklyn Murphy Oct. 6 Yankees 3 Dodgers 1 Brooklyn Bonham	DATE WINNER SCORE PLACE WINNING PITCHER		
St. Louis Cardinals vs. New York Yankees	July 7, 1937 Americans 8-3 Washington Gomez July 6, 1938 Nationals 4-1 Cincinnati Vander Meer July 11, 1939 Americans 3-1 New York (AL) Bridges		
(Cardinals winners, 4 games to 1) DATE WINNERS LOSERS PLACE WINNING PITCHER	July 9, 1940 Nationals 4-0 St. Louis (NL) Derringer July 8, 1941 Americans 7-5 Detroit Smith		
Sept. 30 Yankees 7 Cardinals 4 St. Louis Ruffing Oct. 1 Cardinals 4 Yankees 3 St. Louis Beazley	July 13, 1942 Americans 3-1 New York (NL) Chandler July 13, 1943 Americans 5-3 Philadelphia (AL) Leonard July 11, 1944 Nationals 7-1 Pittsburgh Raffensberger		
Oct. 3 Cardinals 2 Yankees o New York White Oct. 4 Cardinals 9 Yankees 6 New York Lanier Oct. 5 Cardinals 4 Yankees 2 New York Beazley	The following star players were selected as members of		
1943	All-Star clubs, although not all of them participated in the games:		
St. Louis Cardinals vs. New York Yankees (Yankees winners, 4 games to 1)	NATIONAL, W. H. T. N. POSTON O		
DATE WINNERS LOSERS PLACE WINNING PITCHER	NATIONAL: Wm. H. Terry, N.Y., Mgr. BOSTON: G. Moore, of. BROOKLYN: Mungo, p. CHICAGO: Collins, 1b; Demaree, of; Hartnett, c; Herman, 2b; Jurges, ss. CINCIN-		
Oct. 5 Yankees 4 Cardinals 2 New York Chandler Oct. 6 Cardinals 4 Yankees 3 New York M. Cooper Oct. 7 Yankees 6 Cardinals 2 New York Borowy	NATI: Grissom, p; Lombardi, c. NEW YÖRK Bartell, ss; Hubbell, p; Mancuso, c.; J. Moore, of; Ott, of; Whitehead, 2b. PHILADELPHIA: Walters, p. PITTSBURGH: Blanton, p;		
Oct. 10 Yankees 2 Cardinals 1 St. Louis Russo Oct. 11 Yankees 2 Cardinals 0 St. Louis Chandler	Vaughn, 3b; P. Waner, of. ST. LOUIS: J. Dean, p; J. Martin, of; Medwick, of; Mize, 1b.		

AMERICAN: Joseph V. McCarthy, N.Y., Mgr. BOSTON Cramer, of; Cronin, ss; Fox, 1b; Grove, p. CHICAGO Sewell, c; Stratton, p. CLEVELAND Averill, of; Harder, p. DETROIT: Bridges, p; Gehringer, 2b, Greenberg, 1b, G. Walker, of NEW YORK Dickey, c., DiMaggio, of; Gehrig, 1b; Gomez, p; Murphy, p; Rolfa, 3b. PHILADELPHIA Moses, of. ST. LOUIS Bell, of, Clift, 3b; West, of. WASHINGTON: R. Ferrell, c; W. Ferrell, p; Myer, 2b.

1938

NATIONAL: Wm. H. Terry, N.Y., Mgr. BOSTON Cuccinello, 2b; Turner, p. BROOKLYN: Durocher, ss; Lavagetto, 3b; Phelps, c. CHICAGO: Hack, 3b; Hartnett, c; Herman, 2b; Lee, p. CINCINNATI: Derringer, p; Goodman, of; Lombardi, c; McCormick, 1b; Vander Meer, p. NEW YORK Hubbell, p; Leiber, of; J. Moore, of; Ott, of. PHILADELPHIA: H. Martin, of. PITTSBURGH. M. Brown, p; Vaughan, ss; L. Waner, of. ST. LOUIS Medwick, of.

AMERICAN: Jos. V. McCarthy, N.Y., Mgr. BOSTON: Cramer, of; Cronin, ss, Foxx, 1b; Grove, p. CHICAGO: Kreevich, of. CLEVELAND: Allen, p.; Feller, p.; Averill, of. DETROIT Gehringer, 2b; Greenberg, 1b; Kennedy, p; York, c. NEW YORK Dickey, c; DiMaggio, of; Gehrig, 1b; Gomez, p; Rolfe, 3b; Ruffing, p. PHILADELPHIA: R. Johnson, of. ST. LOUIS: Newsom, p. WASHINGTON R. Ferrell, c; Lewis, 3b; Travis, ss.

1939

NATIONAL: C. L. Hartnett, Chi., Mgr. BOSTON: Fette, p. BROOKLYN: Camilli, 1b; Lavagetto, 3b; Phelps, c; Wyatt, p. CHICAGO: Hack, 3b; Herman, 2b; Lee, p. CINCINNATI. Derringer, p; Frey, 2b; Goodman, of; Lombardi, c; McCormick, 1b; Vander Meer, p; Walters, p. NEW YORK: Danning, c; Jurges, ss; Ott, of. PHILADELPHIA: Arnovich, of. PITTS-BURGH: Vaughan, ss. ST. LOUIS: Davis, p; Medwick, of; Mize, 1b; Moore, of; Warneke, p.

AMERICAN: J. V. McCarthy, N.Y., Mgr. BOSTON: Cramer, of; Cronin, ss; Foxx, 1b; Grove, p. CHICAGO: Appling, ss, Lyons, p. CLEVELAND: Feller, p.; Hemsley, c. DETROIT: Bridges, p; Greenberg, 1b; Newsom, p. NEW YORK: Crosettı, ss; Dıckey, c; DıMaggıo, of; Gomez, p, Gordon, 2b; Murphy, p; Rolfe, 3b; Ruffing, p; Selkirk, of. PHILADELPHIA: Hayes, c; Johnson, of. ST. LOUIS: Hoag, of; McQuinn, 1b. WASH-INGTON: Case, of.

1940

NATIONAL Wm. B. McKechnie, Cin., Mgr. BOSTON: Miller, ss: West, of. BROOKLYN Coscarart, 2b; Durocher, ss; Lavagetto, 3b; Medwick, of. Phelps, c; Wyatt, p. CHICAGO: French, p; Herman, 2b; Leiber, of; Nicholson, of. CINCINNATI: Derringer, p; Lombardi, c; F. McCormick, 1b; Walters, p. NEW YORK: Danning, c; Hubbell, p; Jurges, ss; Moore, of; Ott, of. PHILADELPHIA: Higbe, p; May, 3b; Mulcahy, p. PITTSBURGH: Vaughan, ss. ST. LOUIS: Mize, 1b; T. Moore, of.

AMERICAN Joseph E. Cronin, Bos., Mgr. BOSTON: Cramer, of; Finney, of; Foxx, 1b; Williams, of. CHICAGO-Appling, ss. CLEVELAND Boudreau, ss; Feller, p; Hemsley, c, Keltner, 3b; Mack, 2b; Milnar, p. DETROIT: Bridges, p; Greenberg, of; Newsom, p. NEW YORK: Dickey, c; DiMaggio, of; Gordon, 2b; Keller, of; Pearson, p; Ruffing, p; Rolfe, 3b. PHILADELPHIA: Hayes, c; Johnson, of. ST. LOUIS: McQuinn, 1b. WASHINGTON. Leonard, p; Travis, 3b.

1941

NATIONAL: Wm. B. McKechnie, Cin., Mgr. BOSTON: Miller, ss. BROOKLYN Herman, 2b; Lavagetto, 3b; Medwick, of; Owen, c; Reiser, of; Wyatt, p. CHICAGO: Hack, 3b; Nicholson, of; Passeau, p. CINCINNATI: Derringer, p; Frey, 2b; F. McCormick, 1b; Walters, p. NEW YORK: Danning, c; Hubbell, p; Ott, of. PHILADELPHIA: Blanton, p. PITTSBURGH. Elliott, of; Lopez, c; Vaughan, ss. ST. LOUIS: Mize, 1b; Moore, of; Slaughter, of; Warneke, p.

AMERICAN. Delmar D. Baker, Det., Mgr. BOSTON: Cronin, ss; D. DiMaggio, of; Doerr, 2b; Foxx, 1b; Williams, of. CHICAGO: Appling, ss; Lee, p; Smith, p. CLEVELAND-Boudreau, ss; Feller, p; Heath, of; Keltner, 3b. DETROIT. Benton, p; Tebbetts, c; York, 1b. NEW YORK: Dickey, c; DiMaggio, of; Gordon, 2b; Keller, of; Ruffing, p; Russo, p. PHILADELPHIA: Hayes, c. ST. LOUIS: Cullenbine, of. WASHINGTON: Hudson, p; Travis, 3b.

NATIONAL Leo E. Dunocher, B'klyn., Mgr. BOSTON Lombardi, c; Miller, ss. BROOKLYN Herman, 2b, Medwick, of; Owen, c; Reese, ss; Reiser, of; Vaughan, 3b; Wyatt, p CHICAGO: Passeau, p. CINCINNATI Derringer, p, F. McCormick, 1b; Starr, p; Vander Meer, p, Walters, p. NEW YORK. Hubbell, p; Marshall, of; Melton, p, Mize, 1b; Ott, of. PHILADELPHIA: Litwhiler, of. PITTSBURGH: Elliott, 3b ST. LOUIS: Brown, 2b; M. Cooper, p; W. Cooper, c; T. Moore, of; Slaughter, of.

AMERICAN: Joseph V. McCarthy, N.Y., Mgr. BOSTON-D. D1Maggio, of; Doerr, 2b; Hughson, p; Williams, of. CHICAGO: E. Smith, p. CLEVELAND: Bagby, p; Boudreau, ss; Keltner, 3b. DETROIT: Benton, p; Newhouser, p; Tebbetts, c; York, 1b. NEW YORK: Bonham, p; Chandler, p; Dickey, c; D1Maggio, of; Gordon, 2b; Henrich, of; R1zzutto, ss; Rosai, c; Ruffing, p. PHILADELPHIA: Johnson, of, Wagner, c. ST. LOUIS: McQuinn, 1b. WASHINGTON: Hudson, p, Spence, oi.

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NATIONAL: William H. Southworth, St.L., Mgr. BOSTON Javery, p. BROOKLYN: Galan, of; Herman, 2b; Owen, c; F. Walker, of. CHICAGO: Hack, 3b; Nicholson, of; Passeau, p. CINCINNATI: Frey, 2b; F. McCormick, 1b; Miller, ss; Vander Meer, p. NEW YORK: Lombardi, c; Ott, of. PHILADELPHIA Dahlgren, 1b. PITTSBURGH: V. DiMaggio, of; Fletcher, 1b; Sewell, p. ST. LOUIS: M. Cooper, p; W. Cooper, c; Kurowski, 3b; Lanier, p; Marion, ss; Musial, of; Pollet, p; H. Walker, of

AMERICAN: Joseph V. McCarthy, N.Y., Mgr. BOSTON, Doerr, 2b; Hughson, p; Judd, p. CHICAGO: Appling, ss. CLEVELAND: Bagby, p; Boudreau, ss; Heath, of; Keltner, 3b; Rosar, c; A. Smith, p. DETROIT Newhouser, p; Wakefield, of; York, 1b. NEW YORK: Bonham, p; Chandler, p; Dickey, c; Gordon, 2b; Keller, of; Lindell, of. PHILADELPHIA Siebert, 1b. ST. LOUIS: Laabs, of; Stephens, ss. WASHINGTON: Case, of; Early, c; R. Johnson, of; Leonard, p.

1944

NATIONAL: William H. Southworth, St.L., Mgr. BOSTON: Andrews, p; Javery, p; Ryan, 2b; Tobin, p. BROOKLYN. Galan, of; Owen, c; F. Walker, of. CHICAGO: Cavarretta, 1b; Johnson, 2b; Nicholson, of. CINCINNATI: McCormick, 1b; Miller, ss; Mueller, c; Walters, p. NEW YORK: Medwick, of; Ott, of; Voiselle, p. PHILADELPHIA: Raffensberger, p. PITTSBURGH: V. DiMaggio, of; Elliott, 3b; Sewell, p. ST. LOUIS: W. Cooper, c; Kurowski, 3b; Lanier, p; Marion, ss; Munger, p; Musial, of.

AMERICAN: Joseph V. McCarthy, N.Y., Mgr. BOSTON-Doerr, 2b; Fox, of; Hughson, p; Johnson, of. CHICAGO-Grove, p; Tucker, of. CLEVELAND: Boudreau, ss; Cullenbine, of; Hockett, of; Keltner, 3b. DETROIT: Higgins, 3b; Newhouser, p; Trout, p; York, 1b. NEW YORK: Borowy, p; Hemsley, c; Page, p. PHILADELPHIA: Hayes, c; Newsom, p. ST. LOUIS: McQuinn, 1b; Muncrief, p; Stephens, ss. WASHINGTON: Case, of; Ferrell, c; Leonard, p; Spence, of.

1946

NATIONAL: Charles J. Grimm, Chi. Mgr. BOSTON: M. Cooper, p; Hopp, of; Masi, c. BROOKLYN. Higbe, p; Reese, ss, Reiser, of; F. Walker, of. CHICAGO Cavarretta, 1b, Lowrey, of; Passeau, p; Schmitz, p. CINCINNATI: Blackwell, p; Lamanno, c. NEW YORK: W. Cooper, c, Mize, 1b. PHILA-DELPHIA: Ennis, of; Verban, 2b. PITTSBURGH: Gustine, 2b; Sewell, p. ST. LOUIS: Kurowski, 3b; Marion, ss; Musial, of; Pollet, p; Schoendienst, 2b; Slaughter, of.

AMERICAN: Stephen O'Neill, Det., Mgr. BOSTON: D. DiMaggio, of; Doerr, 2b; Ferriss, p; Harris, p; Pesky, ss; Wagner, c; Williams, of; York, 1b. CHICAGO: Appling, ss. CLEVELAND: Feller, p; Hayes, c; Keltner, 3b. DETROIT: Newhouser, p. NEW YORK: Chandler, p; Dickey, c; DiMaggio, of; Gordon, 2b; Keller, of; Stirnweiss, 3b. PHILADELPHIA-Chapman, of; Rosar, c. ST. LOUIS: Kramer, p; Stephens, ss. WASHINGTON: Spence, of; Vernon, 1b.

Hall of Fame.—The origin of the game of baseball had long been obscure, and fans long argued whether the game was a descendant of the British pastime of rounders or whether it had been developed as purely an American sport.

As early as 1905, major league officials appointed a commission to study the matter. This commission re-



Scene during the second game of the 1944 World Series. Don Gutteridge, second baseman for the St. Louis Browns, has just struck out. The St. Louis Cardinals won the game and took the series four days later, four games to two

ported its findings in 1908 and concluded that baseball was an American invention and that the inventor, Abner Doubleday, laid out the first diamond at Cooperstown, N.Y., in 1839. Doubleday, in 1839 a cadet at West Point, later became a major general in the Civil War.

Baseball, then, officially celebrated its Centennial at Cooperstown in 1939, with a series of games between major league clubs, college and amateur teams. A Hall of Fame had been erected to house various relics of baseball, including a baseball made by Doubleday himself.

Elections to the Hall of Fame were made annually by a vote of the Baseball Writers' Association, and other notable figures were appointed to the place of honour by the Centennial Commission. Twelve players were almost immediately chosen for membership, and each of them was honoured by a bronze plaque. The first selections were:

Christy Mathewson.—This great righthanded pitcher of the New York Giants won 373 and lost 189 games in his career, which extended over 17 seasons, from 1900 to 1916. He was born at Factoryville, Pa. on Aug. 12, 1880, and died at Saranac Lake, N.Y., on Oct. 7, 1925. A Bucknell college boy, Matty had only two years of professional experience when he joined the Giants in 1900. He became a winning pitcher immediately, and first reached greatness in the 1905 world series, when he pitched three shutouts against the Philadelphia Athletics. He was noted for his control pitching and for his "fadeaway" curve. He won 30 or more games a year in four different seasons, and 20 or more in 10 others. He was traded to the Cincinnati

Reds in July 1916, and managed that club through 1918, leaving to go overseas as a captain in the Chemical Warfare division of the army in World War I.

Walter Johnson.—Generally accredited as the fastest pitcher who ever lived, Johnson toiled on the mound for Washington for 21 seasons and won the amazing total of 413 games, losing only 280. Many of the teams for which he pitched were second division outfits, but Johnson was practically unbeatable. He won 20 or more games a season 12 different times, and twice won 30 or more. In his career he won a total of 113 shutout games. Johnson was born at Humboldt, Kan., on Nov. 6, 1887, and was a righthander. After finishing his career as an active player, he managed Washington from 1929—32 and Cleveland from 1933 until August, 1935.

Ty Cobb.—Usually referred to as the greatest player of all time, Cobb joined the Detroit Tigers in 1905 and stayed in the major leagues for 24 years. During that time he set a total of 90 records, many of which still stood in 1946. He played more games, went to bat more times, scored more runs, made more hits, had more total bases, and stole more bases than any player who ever lived. He was known for his aggressive type of play, and was frequently involved in fights on the field. He won the American league batting championship twelve times, nine times in a row. He left a major league batting average of .367 for 24 seasons. Cobb was born at Banks County, Ga., on Dec. 18, 1886. He was a lefthanded hitter but threw with his right hand. He managed Detroit from 1921 through 1926 and then closed his career as an active player in 1927 and 1928 with the Philadelphia Athletics

Babe Ruth.—The home run was not the invention of

Babe Ruth, but he popularized it to such a degree that it revolutionized the game. Ruth was the greatest home run hitter in history, but was also an excellent lefthanded pitcher during his early days, and pitched 29 consecutive innings in World Series play without being scored upon. Ruth, who was born at Baltimore, Md., on Feb. 6, 1895, was a lefthanded batter. He came up as a pitcher with the Boston Red Sox in 1914, but proved to be such a powerful batsman that he was used in the outfield when he was not pitching. He was first recognized as a home run hitter in 1919, when he knocked out 29, a remarkable total for those days. He increased the number to 54 in 1920, 59 in 1921, and reached his high of 60 in 1927. Before he retired in 1935, Ruth smashed 714 home runs, in addition to 15 more in world series competition. If he was not so great a player as Cobb, he was the more dramatic, and no player had ever been more widely known.

Honus Wagner.—Born at Carnegie, Pa., on Feb. 24, 1874, Wagner became the game's greatest shortstop, although he was equally at home at other positions. He reached the majors with Louisville in 1897 and when the National league reduced its clubs from 12 to 8 in 1900, Wagner was shifted to Pittsburgh, where he reached his greatest fame. He led the National league in batting eight different seasons, and frequently led the league in two base hits, three base hits, runs scored and hits. Wagner never managed a big league club, and when he retired in 1917 he left the game entirely until 1933, when he returned to Pittsburgh as a coach.

Nap Lajoie.—This stylish second baseman was a French Canadian, born at Woonsocket, R.I., on Sept. 5, 1875. He started his career with the Philadelphia club of the National league in 1896, but spent most of his career in the American league, with Philadelphia in 1901 and with Cleveland from 1902 to 1914, going back to Philadelphia to close his career in 1915 and 1916. Lajoie led the American league in hitting in 1901, 1903 and 1904. Ty Cobb overshadowed him after that. He batted for a mark of .405 in 1901. He managed Cleveland from 1904 to 1909, and after he left the majors he piloted the Toronto and Indianapolis clubs.

Tris Speaker.—Known principally for his defensive play, Speaker was nevertheless a clever batter; he left a mark of .345 for 22 major league seasons. He also hit a total of 793 two-base hits, more than any other player ever accumulated. But it was in the outfield that the "Grey Eagle" chiefly attracted attention. Extremely daring, he played a very shallow centrefield, often catching balls that would ordinarily have fallen for hits. Twice in one season he executed unassisted double plays, a remarkably rare feat for an outfielder. Speaker was born at Hubbard City, Tex., on April 4, 1888, and reached the American league with Boston in 1907. Traded to Cleveland in 1916, he remained with the Indians for a decade, and closed his career with Washington in 1927 and Philadelphia in 1928, where he was a teammate of Ty Cobb's. Speaker managed Cleveland from 1919 to 1926, and served as that club's pilot when it won the 1920 world series from Brooklyn. He led the American league in batting in 1916, the year that Ty Cobb missed.

Cy Young.—Denton True Young took part in 906 major league games, winning 510 and losing 313. Young joined Cleveland of the National league in 1890 and pitched in the majors for 22 years. He went from Cleveland to St. Louis in 1899, then joined the Boston Red Sox in 1901, moved to the Cleveland Americans in 1909 and closed

his career in 1911 with the Boston Nationals. Young won 20 or more games per season 16 times, and passed the 30-mark on five occasions. He pitched two no-hit games, one of them a perfect contest with not one opposing batsman reaching first base.

Grover Alexander.-First pitcher selected for the Hall of Fame after Mathewson, Johnson and Young, Alexander won exactly the same number of games as Mathewson, 373, and did his pitching in a later era. He joined Philadelphia of the National league in 1911, moved to the Cubs in 1918, to the Cardinals in 1926 and closed his career with his old team, the Phillies, in 1930. The record book was dotted with pitching feats of Alexander. He turned in four one-hit games in a single season (1915); hurled a total of 90 shutouts, 16 of them in one year (1916); and twice pitched two games in one day. But he reached the heights in the world series of 1926, when he trudged to the mound as a relief hurler in the seventh and deciding game, struck out Tony Lazzeri to throttle a seventh inning rally of the New York Yankees, and saved the game and series for the Cardinals. Alexander won 28 games his first season in the league. Most of the records for longevity held by Johnson in the American league were held by Alexander in the National.

George Sisler.—One of the foremost first basemen of history was George Sisler, whose career was blighted by sinus trouble when he was at the height of his fame. Sisler started with the St. Louis Browns in 1915. Born at Manchester, Ohio, on March 24, 1893, he was a graduate of the University of Michigan, where he had been a pitcher.

As a batter, Sisler was outstanding, and he twice reached the .400 mark, hitting .420 in 1922. He managed the Browns in 1924, 1925 and 1926, and closed his major league career with the Boston Braves, retiring in 1930. His mark of 257 base hits in a single season (1920) still stood in 1946. He was a lefthanded hitter and thrower.

Eddie Collins.—A second baseman, as was Lajoie, Collins played in the American league for 25 years, a mark for durability which he shared with Shortstop Roderick Wallace. A graduate of Columbia university, he joined the Philadelphia Athletics in 1906, was sold to the Chicago White Sox in 1915, and went back to the Athletics in 1927, retiring after the 1930 season. He managed the White Sox in 1925 and 1926. In 1933 he became vice president, treasurer and business manager of the Boston Red Sox, one of the few players to go from the diamond to the front office. Nine times Collins led the American league in fielding, and he made a total of 511 sacrifice hits—an American league record. Collins was born at Millerton, N.Y., on May 2, 1887. He threw righthanded, but was a lefthanded hitter.

Willie Keeler.—Author of the batting advice to "hit 'em where they ain't," Keeler, one of the original Baltimore Orioles, extended his career with New York in the American league until 1910, retiring with a .345 mark for 19 seasons. A lefthanded batter and thrower, Willie stood only 5 ft., 4½ in. in height and weighed a mere 149 lb. He was generally considered the most scientific hitter of all time. It was his record of hitting safely in 44 consecutive major league games that Joe DiMaggio finally succeeded in smashing. Keeler made his record in 1897. He was born at Brooklyn on March 13, 1872, and died there on January 1, 1923. Eight times during his career he made 200 or more hits in a season, a feat surpassed only by Cobb, who did it nine times.

In addition to the above players, the Centennial commission named the following men as deserving of niches in the Hall of Fame for services apart from playing the game: George Wright, Morgan G. Bulkeley, Ban Johnson, John McGraw, Connie Mack, Henry Chadwick and Alexander Cartwright. Wright was captain of the unbeaten Cincinnati Red Stockings of 1869, the first professional team. Bulkeley was the National league's first president; and Ban Johnson, a former Cincinnati sports writer, was the founder of the American league. McGraw and Mack, of course, were the game's most famous managers—McGraw with the Giants, Mack with the Philadelphia Athletics. Henry Chadwick was one of the game's first writers and historians, a man who invented the box score and codified the rules of scoring games. Cartwright organized the first club, the Knickerbocker Club of New York, in 1845.

After the first selections to the Hall of Fame were made, annual balloting took place to admit others. By the end of 1946 the following additional players had been admitted:

Adrian Anson.—This famous first baseman played National league ball from the circuit's first season, 1876, through 1897, a total of 22 years. Counting the five years of professional baseball which he played from 1871–75 in the National association, his career spanned 27 seasons, more than any other performer ever played. Anson managed Chicago from 1879 to 1897, and also managed the New York Nationals briefly in 1898. Born at Marshalltown, Iowa, on April 11, 1852, he died at Chicago on April 14, 1922. He was the batting leader of the National league

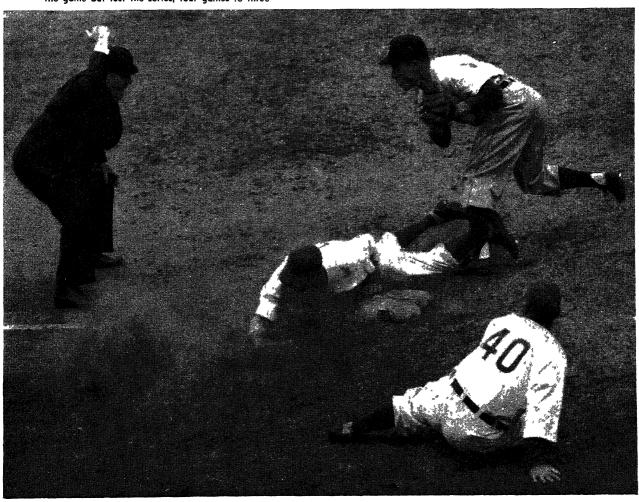
Roy Hughes of the Chicago Cubs being called out at third base in the sixth game of the 1945 World Series. The Chicago Cubs won the game but lost the series, four games to three

for four seasons and hit .300 or better for 20 years. He was a righthanded batter and thrower.

Elected to Hall of Fame membership at the same time as Anson was Henry Louis Gehrig, whose achievements will be considered at another place in this article. Also elected were five famous old-time players, as follows:

Albert Spalding.—One of the game's early pitchers, Spalding had just about concluded his career when the National league was founded. He pitched for the Forest City club of Rockford, Ill., from 1866 to 1870, then hurled for Boston of the National association for five seasons. His last pitching was done for the Chicago Nationals in 1876 and 1877. He won 56 games and lost just 4 for Boston in 1875. From 1882 to 1891 he was owner of the Chicago club, and he founded A. G. Spalding & Bros. in 1876.

Charles Comiskey.—"The Old Roman," as Comiskey came to be known, was the first player to rise to the ranks of club owner. He was first heard of as a first baseman for the St..Louis club of the American association from 1882 to 1889, serving as manager the last six seasons and winning four consecutive pennants from 1885 through 1888. He managed Cincinnati from 1892 to 1894 and then helped in the expansion of the Western league, which eventually became the American. Comiskey was president of the Chicago Americans from 1901 until his death in 1931. As a first baseman he had revolutionized play by staying close to the base only when it was occupied. Prior to him, first basemen had hugged the base at all times.



William Ewing.—"Buck" Ewing was said to have been the greatest catcher of his era (1880–1897) but he was also at home at other positions, and even did some pitching. He was a remarkable batsman, and did most of his hitting for the New York Giants, for whom he performed from 1883 through 1892. Ewing was born at Hoaglands, Ohio, on October 27, 1859, and died at Cincinnati on Oct. 20, 1906. He managed the Cincinnati Reds from 1895 through 1899. He was a righthanded batter and thrower.

Charles Radbourne.—The events of just one season assured "Old Hoss" Radbourne of a place in the Hall of Fame. In 1884, while pitching for Providence, he won 60 games and lost 12, 18 of his victories being consecutive. When the Providence team disbanded after the 1885 season, Radbourne was awarded to Boston, and he continued as a major league hurler through 1891. A graduate of Illinois Wesleyan, Radbourne was one of the first college players. He won 308 games in the majors and lost just 191.

W. Arthur Cummings.—Many players had laid claim to having been the first to have thrown a curve ball, and the honour seems to belong to William Arthur Cummings, who was elected to the Hall of Fame for that reason. Cummings, as a young boy at Ware, Mass., was said to have obtained the idea for the curve from watching the flight of clam shells which he threw. Cummings' claim was endorsed by Henry Chadwick, the game's Boswell. Cummings was at his best in National association days (1871–1875) and did little pitching after the National league came into existence. He died at Toledo, Ohio, on May 17, 1924. His playing weight was only 120 lb.

Three years elapsed before another player was admitted to the Hall of Fame. Then, in 1942, Rogers Hornsby secured enough votes to gain admission.

Rogers Hornsby.—Veteran of 23 years in the big show, seven times a batting champion, manager of four of the five clubs for which he played, Rogers Hornsby hit for the incredible average of .400 over a five year period. A righthanded batter and thrower, Hornsby was the hardest hitter the National league had ever seen. He came to the majors with St. Louis in 1915 and led the league in batting for the first time in 1920. He repeated for the next five years, and also again in 1928, when he was a member of the Boston club. His high mark was .424 in 1924, and he also hit .401 in 1922 and .403 in 1925. As a manager he led the Cardinals to their first pennant and world championship in 1926, and also piloted the Boston Braves, Chicago Cubs and St. Louis Browns. Hornsby was born at Winters, Tex., on April 27, 1896. He made 200 or more hits in a season seven times.

In 1945, ten more old-time players were admitted by special vote. These included:

Wilbert Robinson.—Only player ever to make seven hits in a single game. Famous catcher for the Baltimore Orioles and later manager of the Brooklyn Dodgers.

James Collins.—Top-notch third baseman of the game's early days, Collins left a batting mark of .294 for 14 seasons of major league play. He managed the Boston Red Sox from 1901 to 1906.

Hugh Jennings.—Manager of the Detroit Tigers and various other clubs, Jennings was one of the first of the great shortstops. He led the circuit in fielding for five consecutive seasons. Jennings managed clubs up until 1920. His playing fame was secured with the old Baltimore Orioles.

Fred Clarke.—A manager for two decades, Clarke played the outfield in the majors for 21 years, hitting .315. He

piloted Louisville from 1897 to 1899, and Pittsburgh from 1900 to 1915.

Hugh Duffy.—The highest batting average ever achieved in a season, .438, was hit by Hugh Duffy in 1894 for Boston. He played 17 years in the majors and left a batting average of .330. He later managed the Philadelphia Nationals, Chicago White Sox and Boston Red Sox, for whom he was still active as a coach in 1946.

Roger Bresnahan.—This famous catcher was also the inventor of the shin guard, an accepted part of catching equipment. At New York, he was the battery mate of Christy Mathewson, for whom he played during most of his career. He managed the St. Louis Cardinals from 1909 to 1912, and the Chicago Cubs in 1915.

Dan Brouthers.—First baseman and one of the early game's great hitters, Brouthers left a batting mark of .348 for 17 seasons of play. He participated in games for six different National league clubs from 1880 to 1896.

Ed Delehanty.—One of four brothers who played major league ball, Ed Delehanty was a powerful hitter. His career extended from 1888 to 1903, and he splashed 2,593 hits on the major league scene.

Jim O'Rourke.—"Orator Jim" O'Rourke was one of baseball's early durables. He was in the National league when hostilities began in 1876, and was still around 22 years later. He was an outfielder, first baseman and catcher. He also served as manager of Buffalo and Washington when those clubs were in the National fold.

Mike Kelly.—One of the most picturesque players of history, Michael Joseph "King" Kelly created a sensation when his contract was sold for \$10,000, a fabulous sum for the 1880s. He played with Chicago, Boston and Cincinnati, managing in the Players' league of 1890 and the American association of 1891.

After the admission of these ten men, the famed double play combination of Tinker to Evers to Chance (Joseph Tinker, John Evers, Frank Chance) was admitted as a unit. In the early days of the century this agile trio brought joy to the followers of the Chicago Cubs and despair to their opponents through their agile infield work. But double plays were not recorded at that time, and the number they made was not known.

Record-Makers of the Decade.—Professional baseball's seventh decade was also notable for the number of record performances which were made.

First there was the consecutive game record of Lou Gehrig, which was to end in tragedy. Henry Louis Gehrig, born in New York City, attended Columbia University and then joined the New York Yankees. He was farmed out three times to Hartford, but appeared in a few games for the Yanks in 1923 and 1924. On June 1, 1925, he started his string of 2,130 games without missing one, a streak which carried along up to May 2, 1939. Prior to Gehrig's mark, the record had been 1,308 consecutive games played by shortstop Everett Scott.

Gehrig's streak was stopped at his own request, when he told Manager Joe McCarthy, "You'd better put (Babe) Dahlgren on first today. I'm not doing the club any good out there." It was not known at that time that he had contracted amyotrophic lateral sclerosis, a hardening of the spinal cord. But Gehrig never played again. He remained with the club as non-playing captain, handing the line-ups to the umpire each day. In June of that year he was examined at the Mayo Clinic, Rochester, Minn., and the nature of his ailment was revealed to the public. He was in uniform for the last time when the Yankees took the field against Cincinnati in the World Series of 1939. He died at Riverdale, N.Y., on June 2, 1941.

The record book was well sprinkled with Gehrig accomplishments other than his consecutive game record. He batted in 184 runs in a single season, hit four home runs in a game, led the league in games played eight years, batted in 150 or more runs in a season seven times. and hit a total of 494 home runs (not a record), 23 of them with the bases filled. Four times he was named the most valuable player in his league, and he participated in seven world series and six all-star games.

Another record-maker of epic proportions was Melvin Thomas Ott, who joined the New York Giants in 1926 when he was 17 (actually Ott was with the club in 1925 but did not appear in any games), and under the careful schooling of John McGraw grew to become one of the National league's greatest players. A lefthanded hitter, Ott soon learned to answer the friendly and beckoning rightfield stands at the Polo Grounds and he became a famed hitter of home runs. Prior to Ott, most of the record performances in the National league had been made by Honus Wagner and Rogers Hornsby, and in the latter stages of his career he systematically started to smash them. Through 1946 Ott had scored more runs, collected more total bases, made more extra bases on long hits, more extra base hits, more home runs, more bases on balls and more runs-batted-in than any player in National league annals. The following list shows the old National league record, made prior to Ott, and Ott's record through 1945 (not including his 1946 work, which extended his marks further).

Old Record		Ott's Record	
Runs	Wagner	1,740	Ott 1,857
Total Bases	Wagner	4,878	Ott 5,032
Extra Bases on	_		
Long Hits	Hornsby	1,777	Ott 2,161
Extra Base Hits	Hornsby	1,007	Ott 1,069
Home Runs	Hornsby	301	Ott 510
Bases on Balls	Max Carey	1,040	Ott 1,700
Runs Batted In	Hornsby '	1,597	Ott 1,856

The most sensational pitching feat of the decade was the performance of John Samuel Vander Meer, of the Cincinnati Reds, who in 1938 pitched two successive no-hit games. The first one was against the Boston Braves at Cincinnati on June 11, 1938, and the second one came on June 15, 1938, in a night game at Brooklyn, the first night game ever played at Ebbets Field.

This record was utterly without precedent. Two pitchers, Lawrence J. Corcoran of the Chicago Nationals, and Cy Young, with various clubs, had pitched three no-hit games each. Five others—James Galvin, A. W. Atkisson, Frank E. Smith, Adrian C. Joss, and Hubert B. Leonard had pitched two each. But no hurler had ever pitched two no-hitters in a single season, much less in successive starts. Four pitchers—Howard Ehmke (Boston Red Sox, 1923), Arthur C. "Dazzy" Vance (Brooklyn, 1925), James Galvin (Buffalo, 1884), and Edward Cushman (Milwaukee, Union association, 1884) held the record of allowing the least hits in successive games—one. Then along came Vander Meer.

Vander Meer was a lefthander who stood 6 ft. 1 in. in height and weighed 190 lb. He was enjoying his first full season in the major leagues at the time of his record-breaking performance.

In the first game he faced only 28 batters. Three reached first base, all on walks. The winning score was 3 to 0. In the second game he was wilder and walked eight, but won, 6 to 0. In the ninth inning of the second game he filled the bases with passes but disposed of the last two batters, one on an easy roller to third, and the last man on a short fly to centerfield.

Three years after Vander Meer's performance, the base-ball world was excited by the mighty hitting streak of Joe DiMaggio, peerless outfielder of the New York Yankees. When it continued day after day, sports writers started to thumb through their record books to determine what had been done in the past in the way of consecutive hitting. They found that the following marks had been made:

George Sisler, of the St. Louis Browns, had set the previous major league record by hitting safely in 41 consecutive games from July 27 to September 17, 1922.

William H. Keeler had set the former all-time record of hitting safely in 44 consecutive games from April 22 to June 18, 1897.

DiMaggio started his string on May 15, 1941, by getting one hit against the Chicago White Sox. He was not stopped until he had hit safely in 56 successive games. The streak ended in a night game July 17 at Cleveland Municipal stadium. The pitchers who stopped him were Al Smith, a southpaw, and Jim Bagby, a righthander, with a crowd of 67,468 looking on.

During his record run DiMaggio went to bat 223 times, scored 56 runs, and made 91 hits for an average of .408, hitting 16 doubles, four triples and 15 home runs. Oddly enough, as a player in the Pacific Coast league in 1933, DiMaggio had hit safely in 61 straight games for San Francisco.

Other interesting records were made during the decade by catchers. When Al Lopez, Pittsburgh receiver, finished the 1945 season, he had caught a total of 1,805 games, more than any backstop in history. Lopez continued the string as an active player in 1946. The best previous accomplishment was Charles "Gabby" Hartnett's run of 1,793 games, compiled over two decades of play. The American league record had been 1,721 games by Raymond W. Schalk, who spent 17 years with the Chicago White Sox.

Since Lopez' career coincided with Hartnett's in the years when the latter was usually catching more games than his rival, few people realized that Al was in the process of setting a record. But Hartnett's retirement was the signal for the unobtrusive Lopez to keep plugging away, and he achieved the record as a result.

Lopez reached the majors in 1928 with the Brooklyn Dodgers, spent 1929 with Atlanta, then returned to the majors in 1930. He put in six full seasons with Brooklyn, was traded to Boston prior to the 1936 season, then moved on to Pittsburgh in mid-season, 1940.

Two other catchers set durability records during the decade-Frank W. Hayes, of the American league, and Ray C. Mueller, of the National. Previously the most games ever caught in a single season by a catcher had been 151, by Raymond W. Schalk of the White Sox, in 1920. The National league record of 150 had been set by George Gibson, of Pittsburgh, in 1909. Gibson also held the record for most consecutive games caught in a season, 133. In 1943, Hayes caught the last two games of the season for the Philadelphia Athletics, and Mueller the last 62 for the Cincinnati Reds. In 1944, each was the regular catcher on his club and as the season progressed neither had missed a contest. Gibson's mark was surpassed by both of them late that season. Hayes caught every game played by the Athletics-155; Mueller caught every game played by the reds-155. This completely disposed of Gibson and Schalk, and the question was whether Mueller or Hayes would first miss.

That winter Mueller entered the Army, leaving an unbroken string of 217 games. Hayes continued to catch for

Philadelphia, and although he was traded to Cleveland during the 1945 season, he continued to go behind the bat regularly for that club, and finished the year with a record of 151 games, giving him a consecutive total of 308. Mueller reported to the Reds again in 1946, caught the first 16 games and was then benched, ending his streak at 233.

Another feat which won the accolade of fans was the performance of Theodore Samuel Williams, the "Splendid Splinter" of the Boston Red Sox, who compiled a batting mark of .406 in 1941, the same year in which Joe DiMaggio set his record for consecutive hitting. This was not a record, but it marked the first time that the majors had seen a .400 hitter since William H. Terry, of the New York Giants, slugged .401 in 1930 and the first time that an American league player had done it since Harry Heilmann, of Detroit, batted .403 in 1923.

The rare occasions in which .400 averages previously had been registered were as follows:

Cobb, Detroit Hornsby, St.L. Burkett, CleSt.L. Delehanty, Pha. Sisler, St.L.	1911, 1922, 1895, 1894,	.420; .401; .423; .400; .407;	1912, 1924, 1896, 1899,		1922, 1925, 1899,	.401 .403 .402
Barnes, Chi.	•	- •	-	_	1876,	.403
Anson, Chi.					1879,	.407
Dunlap, St.L.					1884,	.420
Esterbrook, N.Y.					1884,	.408
Stovey, Pha.					1884,	.404
Stenzel, Pgh.					1893,	.409
Duffy, Bos.					1894,	.438
Turner, Pha.					1894,	.423
Thompson, Det.					1894,	.403
Clarke, Louisville					1897,	.406
Lajoie, Pha. (A.L.)					1901,	.405
Jackson, Cleve.					1911,	.408
Heilmann, Det.					1923,	.403
Terry, N.Y. (N.L.)					1930,	.401

In addition to these men, a total of 14 different players hit .400 or more in 1887, when a base on balls counted as a base hit. It would obviously be unfair to include their names along with the others. For if a base on balls had counted as a base hit in 1923, "Babe" Ruth, who drew 170 passes that year, would have hit for an average of .542.

Despite the record of Ted Williams, the champion hitters of the decade were not quite up to par. A record was approached in reverse in 1945 when George "Snuffy" Stirnweiss, of the New York Yankees, paced the circuit's hitters with a mark of .309. Only Elmer Flick's 1905 mark of .306 had been lower and still the league's best. The National league never produced a leading batsman with a lower mark than .320, the figure achieved by Larry Doyle, of the Giants in 1915.

DiMaggio and Williams were the only hitters to repeat as batting champions during the decade in the American league; Ernie Lombardi, the mammoth catcher, and Stanley Musial, of St. Louis, were the only repeaters in the National. The leading batsmen of the decade follow:

National League	
1937 Joseph M. Medwick, St.L.	.374
1938 Ernest N. Lombardi, Cin.	.342
1939 John R. Mize, St.L.	-349
1940 Debs C. Garms, Pgh.	-355
1941 Harold P. Reiser, Brk.	-343
1942 Ernest N. Lombardi, Bos.	.330
1943 Stanley F. Musial, St. L.	.357
1944 Fred Walker, Brk.	.357
1945 Philip Cavarretta, Chi.	355
1946 Stanley F. Musial, St.L.	.365*
*Unofficial	

American League

1937	Charles Gehringer, Det.	.371
1938	James E. Foxx, Bos.	·3 4 9
1939	Joseph P. DiMaggio, N.Y.	.381
1940	Joseph P. DiMaggio, N.Y.	.352
1941	Theodore S. Williams, Bos.	.406
1942	Theodore S. Williams, Bos.	.356
1943	Lucius B. Appling, Chi.	.328
1944	Louis Boudreau, Cleve.	.327
1945	George Stirnweiss, N.Y.	.309
1946	James B. Vernon, Wash.	·353 *
*Uno	official	

In order to qualify as batting champion of the American league, it remained necessary for a player to go to bat 400 or more times. The National league did not have such a regulation, but merely required that a player be in 100 games. In 1940, Debs Garms was declared the champion on this basis. Garms participated in only 103 games, many of them as a pinch-hitter, and went to bat but 358 times. Had the American league rule been in effect, the batting champion of the National league in 1940 would have been Stanley Hack, of the Chicago Cubs, who hit .317.

Perhaps the most controversial record of all was set by Robert Feller, Cleveland's famed fire-ball pitcher, in 1946. Feller had one of his great seasons and his strikeout ball was working with precision. Working out of turn, Feller finished the year with a record of 348 strikeouts, which may or may not have been a record, although the American league accepted it as such.

George "Rube" Waddell, eccentric pitcher of the Philadelphia Athletics, worked in 46 games in 1904, and all authorities agreed on 38 of the games. There were eight contests in which the strikeouts varied, according to which box scores were consulted.

But, however many men "Rube" Waddell struck out, the glory of Bob Feller was undimmed, and he proved to be the strikeout pitcher of his generation.

Feller's record was more impressive than Waddell's if for no other reason than the fact that he pitched 11 less innings than did Waddell. Even so, Feller's total of 372½ innings pitched in a season was extremely impressive. Waddell worked with a less lively ball, in a day when pitchers didn't need the rest that later conditions required.

During the decade there were other records set, most of them minor. Edward Miller, Boston Braves shortstop, established a fielding percentage mark for men at that position in 1942, by fielding .983, surpassing by four percentage points the record established by James E. Cooney in 1927. Miller, incidentally, led the circuit in fielding percentage five times, which tied the record set by Hugh Jennings just prior to the turn of the century.

The St. Louis Cardinals rolled up a team fielding record of .982 in 1944, and in so doing made only 112 errors, the fewest ever chalked up against a major league club.

In 1945 the Cubs won their 16th National league flag, a record, and also set a record when they won both ends of 20 doubleheaders played that season. That same year the Philadelphia Phils had the dubious record of finishing eighth for the 17th time.

Growth of Night Ball.—When Cincinnati, under its general manager, Larry MacPhail, introduced night baseball to the major leagues in 1935, the experiment was viewed with mixed feelings. It was felt that night baseball might be tolerated in Cincinnati, where it might enable the club to make a better attendance record. It was felt that the circus atmosphere of night baseball might lure fans back to the ball parks in Cincinnati, but it was considered unlikely that night ball would flourish in the larger cities of the majors. Wise minor league heads,

mindful of what night ball had already done for the minors, knew differently.

Then, in 1938, lights were installed at Ebbets Field, Brooklyn. A year later, installations at Shibe Park enabled the two Philadelphia clubs to play after dark, and the Cleveland and Chicago American league clubs followed suit. In 1940, Sportsman's Park, St. Louis, was lighted for the Cardinals and Browns; and in 1941 Washington joined the parade. With the erection of lighting plants at Yankee Stadium, New York, and Braves Field, Boston, in 1946 only three major league clubs were without lights—the Detroit Tigers, Boston Red Sox and Chicago Cubs.

At first each club was limited to seven home games, and the New York Giants even declined to play any. But when President Roosevelt expressed the desire for more night baseball during the war, the quota was increased to permit 14 contests in each city, and 21 in Washington, where most government employees were at work during the day.

Later in the war the privilege was further extended, with the result that in such cities as St. Louis and Washington a game played under the natural rays of the sun came to be unusually rare.

The growth of night baseball was extremely rapid, for it dated in the minor leagues only back to 1930. But in spite of opposition to it, it proved to be such a magnet at the gate that it was almost universally adopted.

Night baseball and the war had a curious effect on major league schedules. Games were begun at all hours of the day and night. Big league teams played morning games for the benefit of night shift war workers, started twilight-night doubleheaders at dusk, and played doubleheaders the day after contesting a night game. Toward the end of the war period, the situation changed. Twilightnight twin bills were banned, and most clubs abolished the morning contests.

Player Relations.—The decade was also featured by an attempt on the part of the players to obtain concessions from the owners in regard to playing conditions through the method of collective bargaining, and it resulted in wholesale concessions being granted.

Because of the nature of the game of baseball, the general public had never considered the ballplayer the victim of exploitation to the same degree that an industrial worker was, nor was baseball looked upon as a possible fertile field for the union movement. Players were known as strict individualists, with their salaries varying according to their ability, or according to their persuasive powers in contract negotiations. All previous attempts at unionization had been notable failures.

As early as 1884 the Union association had been formed in competition with the then existing major leagues—the National and the American Associations—as an attempt by the players to manage their own affairs. The league ended after one costly season. Six years later, the Players' league or brotherhood had been formed for the same purpose, and with the same result.

Chief bone of contention in those days had been the cornerstone of baseball law—the reserve clause, a contractual arrangement which bound a player to his club. But loathsome as such an arrangement would be in ordinary pursuits, it was considered absolutely necessary in baseball. Were a player free to go to the highest bidder each winter, the wealthier teams would soon obviously corner the best players, the poorer clubs would be unable to compete with them, and the whole structure of the game would be threatened.

Not since the Federal league war of 1914-15, when

players jumped their contracts in wholesale fashion, had baseball devoted much thought to the reserve clause or to player grievances. After that episode a general amnesty had been declared, and players who jumped had been welcomed back with open arms.

But in the latter days of World War II, two events occurred which led to a review of labour conditions among players. First, there was the Mexican league episode.

Baseball, which was originally a pastime for the people of the United States, had attracted a huge following in Latin America. Teams in Cuba and Mexico contested their games with the same fervour demonstrated by major league clubs. But the game in those countries had never been organized. Then, in 1945, Jorge Pasquel and his four brothers, organized a Mexican league and began bidding for high grade players from the United States.

The Mexican league movement reached its peak early in the 1946 season. Among the best known U.S. players who jumped their clubs and joined the Mexican league were catcher Arnold Owen, of the Brooklyn Dodgers; shortstop Vern Stephens, of the St. Louis Browns; infielder George Hausmann, and pitchers Ace Adams and Harry Feldman, of the New York Giants; pitcher Max Lanier, infielder Lou Klein, and pitcher Fred Martin, of the St. Louis Cardinals. For a few weeks hardly a day passed without some prominent player jumping or threatening to jump. Other players secured more money by revealing Mexican league offers. Major league club owners were definitely alarmed.

Stephens jumped back again, and was permitted to re-join his old club, the St. Louis Browns. Owen also came back, but an edict by Commissioner Chandler barred him for five years. Players and fans alike were almost unanimously in sympathy with the Chandler decision.

The other players remained in Mexico, but apparently the hurricane of player raids had spent its force.

The use of U.S. players in the Latin countries was a new departure. For years the clubs in the United States had been seizing Latin American players, without any regard for their contract obligations. The excuse generally offered was that baseball in other countries had not been organized. This was largely true. As early as 1884 the Providence team of the National league had a Cuban catcher, Vincent Nava. In 1910 the New Britain, Conn., club had imported four Cuban players, and two of them, Armando Marsans and Rafael D. Almeida, reached the major leagues in the following year.

The other factor in altering baseball's labour policy was the attempt by Robert Murphy, a Boston attorney, to organize major league players into a labour union. This attempt came close to succeeding. Murphy wisely settled on Pittsburgh, a strong labour town, for his first test case. The Pittsburgh Pirates, the majority of whom had signed up for the union, went so far as to call a strike, but a last minute vote changed their plans, and the team took the field.

Baseball's answer was the creation of the Executive Council, to be composed of the Commissioner, the Presidents of each of the major leagues, and two other members, one to be elected annually by a majority vote of each of the major leagues; provided, however, that in all matters concerning the standard form of a player's contract or its provisions or regulations, the players should be represented on the Executive Council by two active players, one to be elected annually by the players of each major league. Warren C. Giles, Vice President and Gen-



Paul Richards of the Detroit Tigers sliding safely home in a game against Philadelphia on July 1, 1945

eral Manager of the Cincinnati Reds, was selected as the National league representative, and L. S. MacPhail, President of the New York Yankees, was selected to represent the American league. MacPhail later resigned and was succeeded by Leslie M. O'Connor, Vice-President-Secretary-Business Manager of the Chicago White Sox. The first player representatives to be selected were John J. Murphy of the New York American league team and Fred "Dixie" Walker of the Brooklyn club.

As the decade closed, club owners were working hand in hand with the committee which represented the players. Chief concessions granted to the players included pay for players during the spring training period, the creation of a pension fund, an extension of the post-season period in which players would be permitted to barnstorm, and a liberal change in the ten-day clause. Other problems were being attacked simultaneously, and it was felt that a much better contract between player and club owner would result.

Another issue which plagued baseball but which was settled with the best possible result was the perplexing racial question. There never had been a law in organized baseball which banned the Negro player, but an unmentioned and unwritten policy provided for his exclusion Negroes had been granted tivouts by major league clubs, a few of them had appeared in major league games

for a brief period. But usually they were told that they did not have the ability

A startling answer to the racial question was given by Branch Rickey, general manager of the Brooklyn Dodgers, in the winter of 1945–46 when he announced that the Montreal club of the Brooklyn organization had signed to a contract Jackie Roosevelt Robinson, an infielder, a war veteran, and a Negro. Robinson not only played with Montreal in 1946 but led his league in hitting, and he was considered certain of playing with Brooklyn in 1947. Had Robinson failed, the cause of the Negro would probably have suffered another reverse.

Commissioner's Office.—Judge Kenesaw Mountain Landis had been selected to rule organized baseball with an iron fist, following the unfortunate world series of 1919, when a handful of Chicago players had destroyed public confidence in the game. Keeping aloof from players and club owners alike, Landis was a one-man ruling body for the game.

Landis first became acquainted with baseball law when he heard various trials resulting from the Federal league disputes, but he had long been a fan. From 1920 until his death in Chicago on Nov. 25, 1944, he was one of the most picturesque figures on the national scene. He became celebrated for his decisions, especially his 1940 edict in which he made 91 players belonging to the Detroit Tigers free agents.

During World War II, it often appeared that major

league baseball would be unable to take the field because of the various war problems: the drafting of players, transportation difficulties, and so on. Wisely knowing that the national welfare was more important than a game, Judge Landis refused to ask for special privilege. His policy was to play the game as long as possible with whatever players were available.

Baseball might have been a war casualty. In World War I the "work or fight" order put an abrupt halt to the 1918 season, and made the schedulemakers abbreviate their activity for 1919. Baseball in World War II played every game as scheduled, and the chief reason was the famous "green light" letter from President Franklin D. Roosevelt to Judge Landis, in which the President wrote:

"I honestly feel that it would be best for the country to keep baseball going. There will be fewer people unemployed and everybody will work longer hours and harder than ever before. . . .

before. . . . "Baseball provides a recreation which does not last over two hours or two hours and a half, and which can be got for very little cost. And, incidentally, I hope that night games can be extended because it gives an opportunity to the day shift to see a game occasionally.

see a game occasionally.

"As to the players themselves, I know you agree with me that individual players who are of active military or naval age should go, without question, into the services. Even if the actual quality of the teams is lowered by the greater use of older players, this will not dampen the popularity of the sport. . . .

sport. "Here is another way of looking at it—if 300 teams use 5,000 or 6,000 players, these players are a definite recreational asset to at least 20,000,000 of their fellow citizens—and that in my judgment is thoroughly worthwhile."

That was all the encouragement baseball needed, and Judge Landis' policy was followed to the letter of the law. There were inconveniences, of course. For three years, starting in 1943, major league teams trained north of the Ohio River and east of the Mississippi in order to aid the transportation situation. The amount of money raised by baseball, directly and indirectly, for the Allied cause was almost incalculable. Accounts of the games were shortwaved to U.S. troops all over the world.

There was even a touch of humour to the situation. Major league clubs in 1944 and 1945 presented unheard of players, and others who hadn't been heard of for years. No student of the game would have pretended that baseball of these years was up to par. But the fans took it in good humour. The game was the thing! It was demonstrated that mediocre teams could contest games as closely as finer ones. The 1945 world series between Detroit and Chicago went the full limit of seven games. When asked whom he thought would win it, one Chicago sports writer said, "I don't believe either club is capable of winning."

The death of Judge Landis posed quite a problem for the magnates in the selection of a successor, for the Judge had been a ruler without an heir.

Club officials were in no particular hurry to name a successor. They realized that the appointment was an important one, and that a decision, once made, could hardly be revoked. It wasn't like buying a ballplayer. They finally met in Cleveland, Ohio, on April 24, 1945, and after considering the merits of many candidates, selected U.S. Senator Albert Benjamin Chandler, of the state of Kentucky. Chandler had long been a well-known figure in major league dugouts, where his enthusiasm for the game had taken him. He had played baseball at Transylvania College and had even had a whirl at the professional game.

Not for six months after becoming Commissioner did Chandler resign his Senate post. Then, with World War II over, he did resign, to devote his full talents and energies to the game he had always loved.

One of Commissioner Chandler's first acts was to name Walter W. Mulbry, his college classmate and senate secretary, to the place held by Leslie M. O'Connor for 24 years under Judge Landis, as Secretary-Treasurer of Baseball. Later, he selected H. D. Ruel, Coach of the Chicago White Sox, to serve as Special Assistant to the Commissioner. Ruel left the Commissioner's office late in 1946 to become manager of the St. Louis Browns.

The Commissioner's office was moved from Chicago to Cincinnati.

Attendance.—Perhaps the most remarkable feature of the decade in baseball was the unparalleled attendance records.

In 1943, the two major leagues drew a total of 7,676,281 cash customers and increased it in 1944 to 8,974,738. Then, in 1945, a record total of 10,952,839 was reached. This represented an increase of approximately 22 per cent above 1944, and it seemed certain that the peak had been reached.

But in 1946 baseball fans in major league cities responded so overwhelmingly that the parks almost burst at the seams. In Brooklyn, where baseball almost constituted a psychosis, hardly a day passed without thousands of fans being turned away from Ebbets Field.

War-weary millions with plenty of money and an intense desire for recreation turned to the ball parks as they never had before. And the erection of lights at Yankee Stadium helped swell the total. Unofficial but highly reliable estimates of 1946 attendance placed the figure at 18,612,704, almost doubling the 1945 figure, which had been considered fantastic at the time.

The home attendance figures for each major league club from 1944 to 1946 were as follows:

	NATIONAL	LEAGUE	
	1944	1945	1946
Brooklyn	618,198	1,064,668	1,796,155
Chicago	640,110	1,037,026	1,342,970
New York	733,598	1,038,195	1,234,733
Philadelphia	367,417	310,389	1,045,245
St. Louis	486,851	594,207	1,063,203
Boston	245,197	410,146	987,109
Pittsburgh	653,912	623,398	759,117
Cıncınnati	431,297	294,790	717,751
TOTAL	4,176,580	5,372,819	8,946,283
	AMERICAN	LEAGUE	
	1944	1945	1946
New York	789,995	881,445	2,309,029
Detroit	923,176	1,280,341	1,722,590
Boston	506,975	603,794	1,416,944
Cleveland	475,272	558,182	1,052,289
Washington	525,235	652,660	1,027,221
Chicago	563,539	657,981	988,655
Philadelphia	505,322	462,631	623,145
St. Louis	508,644	482,986	526,548
TOTAL	4,798,158	5,580,020	9,666,421
GRAND TOTAL	8,974,738	10,952,839	18,612,704

Prior to 1946, the most people who had ever attended games in one city in one season were the 1,485,166 who poured into Wrigley Field, Chicago, in 1929. In 1946, the New York Yankees were almost a million in excess of that figure. The Brooklyn Dodgers and Detroit Tigers were also ahead of it.

Six clubs in each league set new park records for attendance. A case in point was that of the Philadelphia Phillies. Thirty years before, in 1916, the Phillies had drawn a few over five hundred thousand for their park

record. That record stood for three decades and was then virtually doubled.

Minor League Baseball.—Not only the majors, but the entire structure of minor league baseball was strengthened by the gigantic attendance of 1946. This was all the more gratifying because minor league baseball had almost gone out of existence during the war. It sank in 1945 to the lowest point it had ever reached. In the scraping of the manpower barrel, the majors could get by with old-timers and under-age boys. But there weren't enough to go around. The leagues of low classification, depending entirely on men well within the draft age, simply gave up and surrendered their franchises.

In its entirety, minor league baseball in 1945 was as follows:

Class AA: American association, International league, Pacific Coast league.

Class A-1: Southern association.

Class A: Eastern league.

Class B: Inter-State league, Piedmont league.

Class C: Carolina league.

Class D: Appalachian league, North Carolina State league, Ohio State league, Pony league.

There were only nine circuits lower than AA classification to feed players to the majors. Even in the midst of the depression, in hopeless 1933, eleven leagues of this type kept their heads above water.

It was expected that minor league baseball would blos-

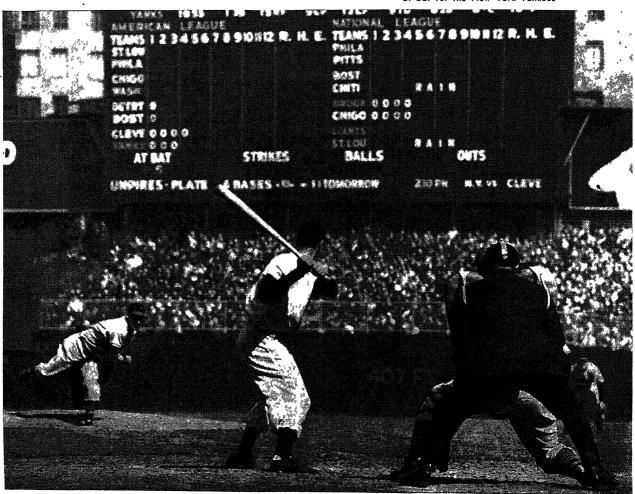
som again, but not to the proportions realized in only one brief year. At the December minor league meeting in Columbus, Ohio, in 1945, Class AAA was created and other league classification changes were effected. By way of contrast, the minor league picture in 1946 was as follows:

Class AAA: American association (Columbus, O., Indianapolis, Ind., Kansas City, Mo., Louisville, Ky., Milwaukee, Wis., Minneapolis, Minn., St. Paul, Minn., and Toledo, O.); International League (Baltimore, Md., Buffalo, N.Y., Jersey City, N.J., Montreal, Que., Newark, N.J., Rochester, N.Y., Syracuse, N.Y., Toronto, Ont.); Pacific Coast League (Hollywood, Calif., Los Angeles, Calif., Oakland, Calif., Portland, Ore., Sacramento, Calif., San Diego, Calif., San Francisco, Calif., Seattle, Wash.).

Class AA: Southern association (Atlanta, Ga., Birmingham, Ala., Chattanooga, Tenn., Little Rock, Ark., Memphis, Tenn., Mobile, Ala., Nashville, Tenn., New Orleans, La.); Texas League (Beaumont, Texas; Dallas, Texas; Fort Worth, Texas; Houston, Texas; Oklahoma City, Okla.; San Antonio, Texas; Shreveport, La.; Tulsa, Okla.).

Class A: Eastern league (Albany, N.Y., Binghamton, N.Y., Elmira, N.Y., Hartford, Conn., Scranton, Pa., Utica, N.Y., Wilkes-Barre, Pa., Williamsport, Pa.); South Atlantic league (Augusta, Ga., Charleston, S.C., Columbia, S.C., Columbus, Ga., Greenville, S.C., Jacksonville, Fla., Macon, Ga., Savannah, Ga.).

Bob Feller delivering a ball during the no-hit game he pitched for the Cleveland Indians on April 30, 1946. Joe DiMaggio is shown at bat for the New York Yankees



Class B: Inter-State league (Allentown, Pa., Hagerstown, Md., Harrisburg, Pa., Lancaster, Pa., Sunbury, Pa., Trenton, N.J., Wilmington, Del., York, Pa.); Mexican National league (Chihuahua, Mexico; El Paso, Texas; Juarez, Mexico; Mexico City, Mexico; Saltillo, Mexico; Torreon, Mexico); New England League (Fall River, Mass., Lawrence, Mass., Lynn, Mass., Manchester, N.H., Nashua, N.H., Pawtucket, R.I., Portland, Maine, Providence, R.I.); Piedmont league (Lynchburg, Va., Newport News, Va., Norfolk, Va., Portsmouth, Va., Richmond, Va., Roanoke, Va.); Southeastern league (Anniston, Ala., Gadsden, Ala., Jackson, Miss., Meridian, Miss., Montgomery, Ala., Pensacola, Fla., Selma, Ala., Vicksburg, Miss.); Three I league (Danville, Ill., Davenport, Ia., Decatur, Ill., Evansville, Ind., Quincy, Ill., Springfield, Ill., Terre Haute, Ind., Waterloo, Ia.); Tri-State league (Anderson, S.C., Asheville, N.C., Charlotte, N.C., Knoxville, Tenn., Shelby, N.C., Spartanburg, S.C.); Western International league (Bremerton, Wash., Salem, Ore., Spokane, Wash., Tacoma, Wash., Vancouver, Canada, Victoria, Canada, Wenatchee, Wash., Yakima, Wash.).

Class C: Border league (Auburn, N.Y., Granby, Que., Kingston, Ont., Ogdensburg, N.Y., Sherbrooke, Que., Watertown, N.Y.); California league (Bakersfield, Fresno, Modesto, Santa Barbara, Stockton, Visalia); Canadian-American league (Amsterdam, N.Y., Gloversville-Johnstown, N.Y., Oneonta, N.Y., Pittsfield, Mass., Quebec, Que., Rome, N.Y., Schenectady, N.Y., Three Rivers, Que.); Carolina league (Burlington, N.C., Danville, Va., Durham, N.C., Greensboro, N.C., Leaksville-Spray-Draper, N.C., Martinsville, Va., Raleigh, N.C., Winston-Salem, N.C.); East Texas league (Greenville, Henderson, Jacksonville, Luskin, Paris, Sherman, Texarkana, Tyler); Florida International league (Havana, Cuba, Lakeland, Fla., Miami, Fla., Miami Beach, Fla., Tampa, Fla., West Palm Beach, Fla.); Middle Atlantic league (Butler, Pa., Erie, Pa., Johnstown, Pa., Niagara Falls, N.Y., Oil City, Pa., Youngstown, O.); Northern league (Aberdeen, S.D., Duluth, Minn., Eau Claire, Wis., Fargo, N.D., Grand Forks, N.D., St. Cloud, Minn., Sioux Falls, S.D., Superior, Wis.); Pioneer league (Boise, Idaho; Idaho; Idaho; Ogden, Utah; Pocatello, Idaho; Salt Lake City, Utah; Twin Falls. Idaho); Western association (Fort Smith, Ark.; Hutchinson, Kas., Joplin, Mo., Leavenworth, Kas., Muskogee, Okla., St. Joseph, Mo., Salina, Kas., Topeka, Kas.); West Texas-New Mexico league (Abilene, Texas; Albuquerque, N.Mex.; Amarillo, Texas; Borger, Texas; Clovis, N.Mex.; Lamesa, Texas; Lubbock, Texas; Pampa, Texas).

Class D: Alabama State league (Brewton, Ala., Dothan, Ala., Geneva, Ala., Greenville, Ala., Ozark, Ala., Troy, Ala.); Appalachian league (Bluefield, W.Va., Bristol, Va., Elizabethton, Tenn., Johnson City, Tenn., Kingsport, Tenn., Narrows, Va., Pulaski, Va., Welch, W.Va); Blue Ridge league (Galax, Va., Mount Airy, N.C., Radford, Va., Salem, Va.); Coastal Plain league (Fayetteville, N.C., Goldsboro, N.C., Greenville, N.C., Kinston, N.C., New Bern, N.C., Rocky Mount, N.C., Tarboro, N.C., Wilson, N.C.); Eastern Shore league (Cambridge, Md., Centreville, Md., Dover, Del., Easton, Md., Federalsburg, Md., Milford, Del., Salisbury, Md., Seaford, Del.); Evangeline league (Abbeville, La., Alexandria, La., Baton Rouge, La., Hammond, La., Houma, La., Natchez, Miss., New Iberia, La., Thibodeaux, La.); Florida State league (Daytona Beach, Deland, Gainesville, Leesburg, Orlando, Palatka, St. Augustine, Sanford); Georgia-Alabama league (Carrollton, Ga., La Grange, Ga., Lanett, Ala., Newman, Ga., Opelika, Ala., Tallassee, Ala.); Georgia-Florida league (Albany, Ga., Americus, Ga., Cordele, Ga., Moultrie, Ga.,



Players of the Mexican Baseball league, on the bench during a 1946 game at Mexico City. The league included several noted U.S. imports including George Hausmann, formerly of the N.Y. Giants and Mickey Owen, catcher for the Brooklyn Dodgers

Tallahassee, Fla., Thomasville, Ga., Valdosta, Ga., Waycross, Ga.); Kansas-Oklahoma-Missouri league (Bartlesville, Okla., Carthage, Mo., Chanute, Kas., Iola, Kas., Miami, Okla., Pittsburg, Kas.); Kıtty league (Cairo, Ill., Clarksville, Tenn., Fulton, Ky., Hopkinsville, Ky., Madisonville, Ky., Mayfield, Ky., Owensboro, Ky., Union City, Tenn.); North Atlantic league (Bloomingdale, N.J., Carbondale, Pa., Mahanoy City, Pa., Nazareth, Pa., Newburgh, N.Y., Nyack, N.Y., Peekskill, N.Y., Stroudsburg, Pa.); North Carolina State league (Concord, N.C., Hickory, N.C., Landis, N.C., Lexington, N.C., Mooresville, N.C., Salisbury, N.C., Statesville, N.C., Thomasville, N.C.); Ohio State league, Dayton, O., Lima, O., Marion, O., Middletown, O., Newark, O., Richmond, Ind., Springfield, O., Zanesville, O.); Pennsylvania-Ontario-New York league (Pony league) (Batavia, N.Y., Bradford, Pa., Hamilton, Ont., Hornell, N.Y., Jamestown, N.Y., Lockport, N.Y., Olean, N.Y., Wellsville, N.Y.); Tobacco State league (Angier-Fuquay Springs, N.C., Clinton, N.C., Dunn-Erwin, N.C., Sanford, N.C., Smithfield, N.C., Wilmington, N.C.); Wisconsin State league (Appleton, Fond du Lac, Green Bay, Janesville, Oshkosh, Sheboygan, Wausau, Wisconsin Rapids).

It will be observed that a total of 43 minor leagues operated in 1946, almost five times as many as in the previous season. These 43 minor leagues drew more than 30,000,000 admissions during the year, a new record.

Each year the winners of the playoff in the American association met the playoff winners of the International league in the Junior World Series, a best four out of seven engagement patterned after the world series. The results of these series played from 1937 through 1946 were as follows:

YEAR	WINNER	MANAGER	GAMES	LOSER	MANAGER
1937 1938 1939 1940 1941 1942 1943 1944 1945	Newark Kansas City Louisville Newark Columbus Columbus Columbus Baltimore Louisville Montreal	MANAGER Oscar Vitt Bill Meyer Bill Burwell Johnny Neun Burt Shotton Eddie Dyer Nick Cullop Tommy Thoma Harry Leibold Clay Hopper	7 7 7 6 6 5 5 6	Columbus Newark Rochester Louisville Montreal Syracuse Syracuse Louisville Newark Louisville	Burt Shotton Johnny Neun Billy Southworth Bill Burwell Clyde Sukeforth Jewel Ens Jewel Ens Harry Leibold Bill Meyer HarryLeibold
					•

Champions of the Pacific Coast League during the decade (winners on a percentage basis during the regular season, not winners of the playoff) were as follows:

		P
	Sacramento	
1938	Los Angeles	
1939	Seattle	
1940	Seattle	
1941	Seattle	•5
1942	Sacramento	
1943	Los Angeles	
1944	Los Angeles	
1945	Portland	.6
1946	San Francisco	.6

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(A. B. Cr.)

Basketball

Elimination of the centre jump in 1937 brought basketball a period of revolution unparalleled in major sports. Not only did play become faster and scoring higher, but attendance and popularity soared; an estimated 100,000,000 fans witnessed basketball games during the 1946–47 season.

Prior to 1937, the ball had been put in play at the beginning of each period and after each goal by tossing it between the two opposing centres at mid-court, thus giving each team an equal opportunity to obtain the ball. The new 1937 rules read: "After a goal from the field, any player of the team scored upon shall put the ball in play from any point out of bounds at the end of the court where the goal was made." The team was given ten seconds to move the ball across the centre line or forfeit it to the opposing team.

The elimination of the centre jump, except at the start of each half and after the calling of technical and double fouls, speeded up the game considerably. Additional rules were changed throughout the following ten years, such as the permission of five personal fouls instead of four; but all were of minor consequence compared to the revolutionary move of 1937, which sent scores soaring steadily. Of the 6,000 college games played in 1945, the average game produced a record 90 points for both teams. In 1946, the record rose to 91.8 for 9,000 contests.

In keeping with the rise in scoring over the 1937–46 decade, Robert Kurland of Oklahoma Agricultural and Mechanical college finished the 1945–46 season with an all-time scoring record for major competition with 58 points against St. Louis university. George Mikan of DePaul university set a career-total of 1,870 points, two more than any other player in the modern history of major college basketball.

As further proof of the increased scoring tempo, the first 23 among all-time individual scorers for a single season performed after 1937. Of the 14 top scorers for a single game, all but two were made under the changed rules. Of the 14 high scorers during collegiate careers, all but one had the benefit of the 1937 changes in play.

Tournaments, Double-Headers, All Stars.—Another development in basketball during the decade was the tournament. In 1939, the National Collegiate Athletic Association inaugurated annual tournaments to select national champions, with semifinal competitions to determine representatives from the east and west, usually at New York city and Kansas City, and the championship playoff at Madison Square garden, New York. Oklahoma A. & M. was the only two-time winner of the N.C.A.A., while the west held a six to two edge through 1946. Dartmouth and Ohio State each had appeared in four of the eight tournaments and captured six of ten decisions.

The National Invitation tournament was started in 1938, drawing eight outstanding college teams to Madison Square garden. St. John's and Long Island university each won the invitation tournament twice, the former scoring in the successive seasons of 1943 and 1944. Such other tournaments as the National Intercollegiate at Kansas City, Mo., and the World Professional at Chicago also added to the interest and drawing power of tournament play after 1937.

The presentation of two college games on the same program had been an innovation at Madison Square garden in 1936, but did not realize its full potentialities until the 1940s. There were 21 bills presented at the garden in 1946, drawing an average of 18,112 fans for a total of 380,346. Double-headers were begun in 1941 at the huge Chicago stadium, and in the final game of 1946 drew 22,822 fans, largest crowd to see a college basketball contest. During 1945–46, more than 162,000 fans witnessed 12 double-headers at the Chicago stadium.

Boston, Philadelphia, Buffalo and other major cities also inaugurated double-headers during the new era of post-1937 basketball.

In 1939, outstanding college players of the previous season played the world's professional champion in what was to become an annual game. At the close of 1946, the collegians had won five of the games, and the professionals two, both successively by the Fort Wayne, Ind., Zollners in 1944 and 1945.

Professionals.—The paid-to-play phase of basketball also received great impetus from 1937 to 1946. At the close of 1946, three major leagues—the National, American and Basketball Association of America—were in operation, along with numerous minor and semipro circuits.

Newest addition to the professional circle was the Basket-ball Association of America, organized in the summer of 1946 by the Arena Owners association. Having access to the leading indoor stadia in the country, such as the Chicago stadium, Madison Square garden and Boston garden, the B.B.A.A. provided a serious threat to the established National and American leagues.

Outstanding Players and Teams.—The new type of basketball was quick to enhance the brilliance of the individual, and the ten-year period from 1937 to 1946 was replete with outstanding athletes. Angelo "Hank" Luisetti of Stanford grabbed the spotlight at the start of the era, and soon it was turned on such stars as George Glamack of North Carolina, Andy Phillips of Illinois, "Brooms" Abramovic of Salem, Mikan of DePaul, Kurland of Oklahoma A. & M., Bob Davies of Seton Hall, Gail Bishop of Washington State, Ed Riska and Leo Klier of Notre Dame,

Annual selections of the Helm foundation for "player of the year" among college athletes were as follows from 1937 to 1946: Luisetti of Stanford, 1937 and 1938; Chet Jaworski, Rhode Island State, 1939; Glamack of North Carolina, 1940 and 1941; Stan Modzelewski of Rhode Island State (who later played basketball under the name of Stan Stutz), 1942; George Senesky, St. Joseph's, 1943; Mikan of DePaul university, 1944 and 1945; Kurland, Oklahoma A. & M., 1946.

In the professional field, Bobby McDermott, a player who never attended college, stood out as player-coach of the Fort Wayne, Ind., Zollners. Under McDermott, the Zollners won the world's professional championship in 1944, 1945 and 1946.

Starting with Stanford in 1937, many outstanding teams dominated play during the decade. Wisconsin and Long Island university were standouts in 1941, while Notre Dame had formidable teams in 1938, 1941 and 1946. The "Whiz Kids" of the Illinois team in 1942 were regarded as one of history's finest fives. DePaul, with Mikan at centre, was ranked no lower than third nationally during the three-year period from 1944 to 1946. Oklahoma's feat of winning successive National Collegiate Athletic association tournaments in 1945 and 1946 had no parallel. Wyoming was an exceptional team in 1943.

The Phillips "66" squad of Bartlesville, Okla., dominated the A.A.U. national tournament in the later years of the decade with successive championships from 1943 to 1946. In the ten-year period, Phillips "66" won five A.A.U. titles and finished second on three occasions.

Although many women's teams switched to men's rules, the A.A.U. championship continued to be conducted under the women's code. Led by Alline Banks, seven times "All-American" and high tournament scorer for four years, Nashville, Tenn., was the only team to win the national title three straight years.

Year-by-Year Developments.—In 1937, first year of the decade, Stanford was rated the No. 1 team in the country, even as the Indians' Luisetti stood out among individuals. Pennsylvania topped the Eastern league, while Minnesota won its only Western Conference championship of the decade. Kansas, which shared in six of the ten Big Six championships, was tied with Nebraska for first place. Georgia Tech in the southeast, Southern Methodist in the southwest, Montana State in the Rocky Mountain conference and Stanford on the Pacific coast were other sectional leaders. In the 1937 A.A.U. tournament, the Denver Safeways of the host city won the men's championship with a 43-38 victory over Phillips "66" in the final. Little Rock, Ark., broke a three-year reign of the Tulsa, Okla., Stenos in winning the women's title, and defeated Galveston, Tex., in the final, 17 to 10.

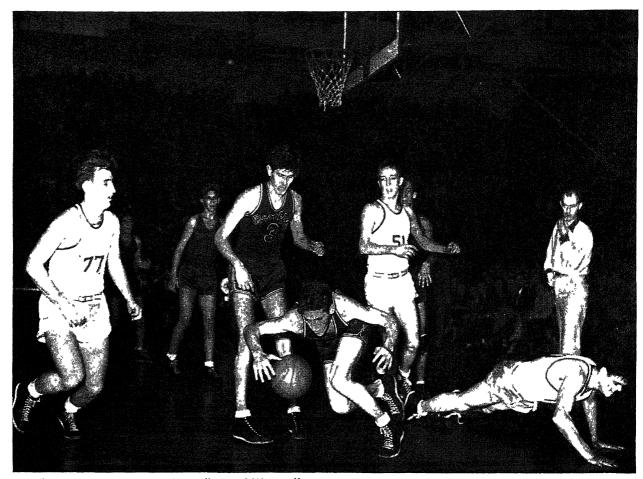
Temple rose to the pinnacle as the No. 1 team of 1938, although eastern play was highlighted by Dartmouth's launching of an eight-title reign at the top of the Eastern league. Purdue, always a power, won the Western Conference championship, and Kansas took precedence in the Big Six. Other conference champions were: Kentucky, southeast; Arkansas, southwest; Colorado, Rocky mountain, and Stanford again on the Pacific coast. Temple highlighted its successful season by winning the National Invitation tournament inaugural, defeating Arizona, 77 to 53; West Virginia, 59 to 51, and Rhode Island State, 46 to 45. The Healy Motors of Kansas City, Kan., won the men's A.A.U. title with a 40–38 victory over Denver, Colo., Safeways in the final. The Galveston, Tex., Anicos made it two in a row with a 13–8 victory over Wichita,

Kan., in the women's final. Oshkosh, Wis., won the championship of the newly-launched National Pro Basketball league.

In 1939, Long Island university won the National Invitation tournament and gained No. 1 rating by the Helm foundation as best team of that year. Long Island defeated New Mexico Aggies, 52 to 45; Bradley Tech, 36 to 32 and Loyola university, 44 to 32, in winning the invitation. The National Collegiate Athletic association inaugural was won by Oregon, 46-33, over Ohio State. Dartmouth continued to pace the Eastern league; Ohio State won the first of two Western Conference (Big Nine) championships it was to acquire in six years, and the Big Six became involved in a two-way tie between Oklahoma and Missouri. Other sectional leaders were: Alabama, southeast; Texas, southwest; Greeley State, Rocky mountain; Oregon, Pacific coast. The Denver Nuggets defeated Phillips "66," 25 to 22, in the annual A.A.U. men's championship. The Galveston, Tex., Anicos, coached by Frances Williams, the first woman to lead a team to the title, won the women's A.A.U. title with an easy 21-8 victory over Little Rock. Oshkosh repeated as National league champion, and the world pro crown went to the New York Rens. Dr. James Naismith, inventor of basketball in 1891, died during 1939.

Interest in basketball picked up noticeably during 1940, with 212,672 spectators attending 15 double-headers at Madison Square garden. No outstanding college team developed during the year. Indiana won the N.C.A.A. with a 60-42 victory over Kansas in the final; Colorado won the national invitation with victories over DePaul, 52 to 37 and Duquesne, 51 to 40, and Southern California was rated the No. 1 team by the Helm foundation. Dartmouth continued to dominate the Eastern league for its third straight title in 1940; Purdue returned as Big Nine champion, and the Big Six became entangled in a three-way tie between Kansas, Oklahoma and Missouri. Other sectional leaders were: Kentucky, southeast; Rice, southwest; Colorado, Rocky mountain; Southern California, Pacific coast. Phillips "66" moved up into the A.A.U. title ranks with a 39-36 final victory over the Denver Nuggets, while Little Rock, Ark., started a two-year reign of the women's A.A.U. tournament with a 23-13 triumph over the Nashville, Tenn., Business college sextet. The Akron, O., Firestones won the National League crown in 1940, and the Harlem Globetrotters won the world's pro tour-

Wisconsin rated No. 1 acclaim in 1941 on its Big Nine championship, its triumph in the N.C.A.A. tournament and its top recognition by the Helm foundation. The Badgers defeated Washington State in the N.C.A.A. final, 39 to 34. Long Island university, which defeated Wisconsin during the regular season, 56 to 42, won the national invitation with victories over Westminster, 48 to 36; Seton Hall, 49 to 26 and Ohio State, 56 to 42. Dartmouth went through the formality of winning its fourth Eastern crown in 1941; Kansas and Iowa State divided honours in the Big Six, and Duke in the south, Arkansas in the southwest, Montana State in the Rocky mountain, and Washington State on the Pacific coast were returned sectional winners. The 20th-Century-Fox team of Hollywood defeated the Olympic club of San Francisco in their all-California final, 47 to 34. Luisetti, former Stanford star with the Olympic club, was voted the tournament's most valuable player. Little Rock won its second straight women's championship over Nashville, 16 to 15. The



Fast play in a game between Brooklyn college and Western Kentucky in Dec. 1944. The game ended with a close score of 49–45 in favour of Brooklyn

Firestones of Akron, repeated as National league champion in 1941, while Detroit won the world's pro tournament.

In 1942 Stanford university easily soared to the National Collegiate Athletic association championship with a 53-38 victory over Dartmouth in the final, and also added the Southern division crown of the Pacific Coast conference to its accomplishments. The National Invitation tournament was won by West Virginia with a close victory, 47 to 45, over Kentucky in the final. West Virginia defeated Long Island university, 58 to 49, and Toledo, 51 to 39, to reach the title game. Dartmouth captured its fifth straight Eastern championship in 1942, while Duke continued its hold on the Southern conference and Kentucky, and Georgia shared honours in the southeast. Illinois won the Western conference title, while other sectional winners were as follows: southwest, Arkansas and Rice; Missouri valley, Creighton and Oklahoma A. & M.; Big Six, Kansas and Oklahoma; Big Seven, Colorado; Pacific coast, Stanford (southern division) and Oregon State (northern division); New England, Rhode Island. Both A.A.U. championships went west of the Mississippi in 1942, the Denver, Colo., American Legion winning the men's championship with a final victory over Phillips "66" and the women's going to the American Institute of Commerce at Davenport, Ia. On the professional front, Wilmington, Del., won the American league championship and Oshkosh, Wis., topped the National league and won the annual world professional tournament. Oshkosh was beaten by the college all-stars, 61 to 55, in the exhibition game which

launched the 1942-43 season. The year 1942 also marked the reappearance of service teams in major college basketball, with the Great Lakes Naval Training station generally judged the outstanding service team of the year.

In its last big year until the end of World War II, college basketball brought forth two outstanding teams in 1943-the universities of Illinois and Wyoming. Illinois, manned by the famous "Whiz Kids," all of whom were in the armed services by the start of the 1944 season, won the Western conference championship, but did not compete in postseason tournaments. Wyoming started its successful campaign by winning the Rocky Mountain conference and went on to capture the National Collegiate Athletic association tourney, defeating Georgetown in the final, 46 to 34. St. John's university of Brooklyn captured the first of its two successive National Invitation titles by defeating Rice, 51 to 49; Fordham, 60 to 43, and Toledo, 48 to 27, in the 1943 tournament. In a Red Cross benefit bringing together the two tournament victors, Wyoming stopped St. John's, 52 to 47. Dartmouth once again topped the Eastern league, winning its sixth straight title. Duke continued as ruler of the south in spite of serious opposition from George Washington university. Rice and Texas shared the southwest title and Tennessee and Kentucky dominated the southeast. Washington proved outstanding on the Pacific coast, while Kansas topped the Big Six and Creighton the Missouri Valley conference. Phillips "66" regained its National A.A.U. championship with a 57-40 victory over the Denver legion in the final. The American Institute of Commerce of Davenport, Ia., repeated as A.A.U. women's title holder with a 41-31 triumph over Des Moines in an all-Iowa final. Fort Wayne,

Ind., won the 1943 National league championship and the Philadelphia Sphas topped the American league. The Washington, D.C., Bears captured the world pro championship, but were beaten by the College All-Stars, 35 to 31, in the 1943 exhibition at Chicago.

Hardly recognized as a title contender at the start of the 1944 season, the University of Utah became the nation's leading college team with a series of late-season successes. Utah rose to prominence with a 40-33 victory over Iowa State in the western N.C.A.A. playoff, and went on to defeat Dartmouth in the east-west final, 42 to 40. It wound up as champion of all it surveyed by taking the measure of St. John's, 43 to 36, in the Red Cross playoff involving the N.C.A.A. and National Invitation champions. St. John's retained its invitation title with a three-way conquest of Bowling Green, 44 to 40; Kentucky, 48 to 45 and DePaul, 47 to 39. Dartmouth won its seventh straight Eastern title in 1944, and Army finished a 15game schedule without a defeat. Ohio State won the Big Nine title in a close finish with Iowa, while Duke in the south, Kentucky in the southeast and Rice and Arkansas in the southwest were other sectional winners. Iowa State and Oklahoma were tied for the Big Six title; Oklahoma A. & M. topped the Missouri Valley conference; Washington and Southern California topped the northern and southern divisions, respectively, of the Pacific Coast conference. For the third straight year, Phillips "66", and the Denver Legion reached the A.A.U. men's final in 1944, with the former retaining the title on a 50 to 43 victory. The Nashville, Tenn., Vultrees won the women's A.A.U. crown with a 23-15 victory over Des Moines, Ia. Fort Wayne dominated professional basketball by capturing the National league and world's pro title, while the Wilmington, Pa., Bombers led the American league. Fort Wayne brought the pros their first victory in five allstar games by defeating the collegians, 48 to 38, at the 1944 classic in Chicago.

In 1945, Oklahoma A. & M. college started a two-year reign of major college basketball by winning both the N.C.A.A. and Red Cross finals. The Oklahoma Aggies first won the national collegiate final with a 49-45 conquest of New York university, and annexed the Red Cross title on a 52-44 victory over DePaul. Led by Mikan, who established six tournament scoring records, DePaul waded impressively through three opponents to capture the national invitation meet. DePaul toppled West Virginia, 76 to 52; Rhode Island State, 97 to 53 and Bowling Green, 71 to 54. Among Mikan's six scoring marks was that of 53 points for the Rhode Island State game. Pennsylvania interrupted a string of seven straight championships for Dartmouth and won the Eastern league title, but Army was judged the leading team on the Atlantic coast. St. John's led the Metropolitan league. The University of Iowa captured its first Big Nine championship with 11 victories and one defeat. The University of North Carolina replaced Duke as champion of the Southern conference, while Kentucky repeated in the southeast and Rice Institute dominated the southwest. Iowa State won the Big Six championship; Oklahoma A. & M. added

					Daskerban 10	or manners viringers	
	Y	ea	ır		National Collegiate Athletic Association	National Invitation	World Professional
1937					No tourney	No tourney	No tourney
1938					No tourney	Temple	No tourney
1939					Oregon	Long Island U.	New York Rens
1940					Indiana	Colorado	Harlem Globetrotters
					Wisconsin	Long Island U.	Detroit
1942					Stanford	West Virginia	Oshkosh, Wis.
					Wyoming	St. John's	Washington, D.C.
1944						St. John's	Fort Wayne, Ind.
					Oklahoma A. & M.	DePaul	Fort Wayne, Ind.
					Oklahoma A. & M.	Kentucky	Fort Wayne, Ind.

Rackethall Tournament Winner

the Missouri valley crown to its national rating; the University of Utah topped the Big Seven, and the University of Oregon and University of S. California at Los Angeles won the north and south divisions, respectively, of the Pacific Coast conference. "Phillips "66" won its third straight A.A.U. title in 1945, defeating the Denver Ambrose, 47–46, in the final. The Nashville Vultrees retained their women's A.A.U. championship with a 22–20 victory over Little Rock, Ark., in the final. The Fort Wayne Zollners again dominated the professional game by winning the National league championship and defeating the college all-stars in their annual exhibition. The Philadelphia Sphas won the American league title.

Basketball was marred by its biggest scandal in 1945. Five members of the Brooklyn college basketball team were expelled from school for accepting bribes to "throw" a game. Two gamblers were sentenced to one year in jail and fined \$500 as authors of the bribes.

In 1946, Oklahoma A. & M. once again rose to the top of the collegiate basketball picture during a return of the game to its prewar popularity. Record crowds, including 628,718 for the double-header and tournament schedule at Madison Square garden, were attracted by postwar basketball, which was climaxed by Oklahoma A. & M.'s 43-40 conquest of North Carolina in the N.C.A.A. final. Led by seven-foot Kurland, the Oklahoma Aggies won 31 and lost two games. The University of Kentucky won the National Invitation championship in 1946, defeating Arizona, 77 to 53; West Virginia, 59 to 51, and Rhode Island State, 46 to 45, in that order. Dartmouth regained its Eastern championship for a record of eight titles in nine years. New York university and St. John's divided Metropolitan league honours, while Kentucky led in the southeast, Duke in the south, and Baylor in the southwest. Ohio State won the Western conference championship; Kansas led the Big Six; Oklahoma A. & M. led the Missouri valley, and Wyoming topped the Big Seven. The University of Idaho won its first title since 1923 in taking the Pacific Coast championship, defeating the University of California in the playoff. championship, drawing a record 64 teams, went to Phillips "66" for the fourth straight time. The Bartlesville, Okla., team defeated the San Diego Dons, 45 to 34, in the final. The Nashville, Tenn., Goldblumes won the women's crown with a 26-20 victory over Des Moines, Ia.

The Fort Wayne Zollners repeated as world professional champions in 1946, but lost the annual classic to the college all-stars, 57 to 54. Rochester, N.Y., won the National

College Conference Basketball Champions, 1937 to 1946

Year	Eastern	Big Nine	Big Six	Southeast	Southwest	Rocky Mountain	Pacific Coast
1936-37	Penn		Kansas and Nebraska	Georgia Tech	So. Methodist	Montana State	Stanford
1937-38	Dartmouth		Kansas, Oklahoma and Missouri	Kentucky	Arkansas	Colorado	Stanford
1938-39	"			Alabama	Texas	Greeley State	Oregon
1939-40	,,		Kansas, Oklahoma and Missouri	Kentucky	Rice	Colorado	U.S.C.
1940-41	,,		Kansas and lowa State	Alabama	Arkansas	Montana State	Washington State
1941-42	,,					Colorado	Stanford and Oregon State
1942-43	"	Illinois	Kansas		Rice and Texas	Wyoming	Washington
1943-44	"	Ohio State	Iowa State and Oklahoma	Kentucky	Arkansas	Utah	Washington and U.S.C.
1944-45	Penn	lowa	Iowa State	Kentucky	Rice	Utah	Oregon and U.S.C.
1945-46	Dartmouth	Ohio State	Kansas	Kentucky	Baylor	Wyoming	Idaho

league title, while the Baltimore, Md., Bullets emerged as champions of the American league.

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Basutoland

See British South African Projectorates.

Bataan

See PHILIPPINES, REPUBLIC OF THE; WORLD WAR II.

Bathysphere

See MARINE BIOLOGY.

Batista y Zaldivar, Fulgencio

Batista (1901—), Cuban army officer and statesman, worked at odd jobs in his youth, joined the Cuban army in 1921 and the rural guard in 1923. Later he became a clerk at staff headquarters. One of the leading figures in the revolt that overthrew the Gen. Gerardo Machado dictatorship in 1933, Batista was appointed chief of the army staff after Machado's downfall. In turn Batista exercised dictatorial rule over all Cuba and governed for seven years without a mandate from the people. Finally in Dec. 1939 he announced he would be a candidate in the presidential elections for 1940.

Nominated by a Socialist Democratic coalition, Batista defeated his opponent, Ramón Grau San Martín, in the elections of July 1940, and he was installed in office the following October. After Cuba declared war on the axis in Dec. 1941 Batista took energetic measures against axis sabotage and espionage and arrested all aliens suspected of dealings with the enemy powers. In 1944 a threatened revival of student revolutionary organizations, similar to those which had inspired the revolution that swept Machado out of office, led Batista to order new elections. On June 2, 1944, Grau San Martín was elected in what foreign observers called the first "clean" elections in Cuba in 30 years. Credit was given Batista for the electoral organization and the astonishing lack of fraud. Although Grau San Martín had won the presidency, Batista's supporters had won a majority of seats in both houses of congress. Batista retired in Oct. 1944 and subsequently toured the Americas.

Batt, William Loren

Batt (1887?—), U.S. government official and industrialist, was born in Salem, Ind., and was graduated from Purdue university in 1907 with a degree in engineering. He assisted in the research and installation of ball bearings in locomotives, and later became president of the S.K.F.

Industries, a Swedish-owned ball-bearings firm.

A deputy commissioner of the National Defense Advisory committee's raw materials division in 1940, he became deputy director of the production division of the Office of Production Management in Jan. 1941, later becoming director. He was also a member in 1941 of President Roosevelt's special mission to Moscow, with rank of minister. Donald Nelson, director of the War Production board, named Batt head of the WPB's requirements committee as well as director of the raw materials division in Jan. 1942. Batt resigned from the WPB in May 1942 to devote more time to his other posts.

In Aug. 1943, following creation of the U.S.-Canada Joint War Aid committee by President Roosevelt and Prime Minister Mackenzie King, Batt was appointed as one of the heads of the U.S. delegation. On Sept. 8, 1945, he was named to head yet another government office, that of the newly-created interagency policy committee on rubber, whose purpose was to formulate a co-ordinated national policy and avert a possible serious rubber shortage.

Battleships

See Navies of the World.

Bauxite

World production data on bauxite, as shown in Table I, were revised for nearly all of the important producing countries, giving the most reliable figures available after censorship cut off so much of the information during World War II.

War demand necessitated increased supplies of bauxite, not only for aluminum, but for other uses, especially abrasives and chemicals. The largest increases occurred in British Guiana, Hungary, Surinam and the United States. All told, output increased nearly fourfold. Of the peak output of 1943, the United States produced 45%, as compared with 12% in 1937 and 9% in 1939.

During World War I, U.S. production of bauxite rose to a peak of nearly 680,000 short tons, three times the prewar level of operation. After that war the opinion was freely expressed that so much of the cream had been skimmed off the domestic reserves to satisfy the war demand that production would never again be able to equal the war rate. This prediction held trué through the beginning of World War II and up to 1941. During the interwar period, the U.S. domestic output had ranged from 300,000 to 500,000 tons, with increasing amounts of imports to meet the rising demand; imports first exceeded output in 1925 and from then up to 1940, imports supplied a total tonnage that considerably exceeded the domestic production.

The progress of the bauxite industry in the United States during 1937-45 is outlined in Table II.

War production of bauxite in the United States did not get under way until in 1941, but then it made up for lost time, with a total output of 17,760,000 tons of crude baux-

Table I World Production of Bau	xite
(Short tons)	

			,						
B to L o .	1937	1938	1939	1940	1941	1942	1943	1944	1945
British Guiana	336,792	421.534	533,136	699,427	1,169,529	1,340,128	2 1 1 5 401		
rrance	758,610	752,261	880,000*	537.950	647,520		2,115,401	1,023,141	736,084
Gold Coast				337,730		704,994	1,010,103	733,740	220,000*
Hungary	587,154	596,039			16,409	49,347	179,329	118,889	132,000*
Italy			534,600	770,000*		1,145,000	1,102,300	992,000	• • •
Netherland Indias	426,038	397,755	533,480	584,000*	598,424	561.550	300,000*	100,000*	2,848
Netherland Indies	219,327	270,456	254,268	302,414	189,400	300,000*	660,000*	300,000*	•
Surinam	432,599	415,806	563,963	679,400	1,321,010	1,353,100	1.824.487	689.831	750,070
U.S.S.R.	250,000*	275.000*	300.000*	330,000*		300.000*			753,970
United StatesT	476,085	348,226	420.344	491,912			385,000*	440,000*	440,000*
Yugoslavia	389,373	435,819	350,359	319,700		2,914,278	6,980,829	3,162,571	1,099,140
		400,017	330,339	319,700	255,100	264,500	220,000	165,000	
Total	4.118.000	4,232,000	4,735,000	4,915,500	6,505,300	0.075 500			
	.,,	.,,	400000	4,713,300	0,505,500	9,2 7 5,500	15,607,600	8,230,400	4.316.600

^{*}Estimates.
†Mine shipments, dried bauxite equivalent.

	1937	1938	1939	1940	1941	1942	1943	1944	1945
Mined crude	• • •	•••	•••	571,057	1,215,259	3,381,207	8,156,551 6,980,829	3,721,135 3,162,571	1,284,399 1,099,140
Dried equivalent	470.660*	040717*	420,337*	491,912 567.884	1.161.574	2,914,278 3,223,614	7.896.317	3,676,498	1,511,281
Mine shipments, crude	476,085	348,717* 348,226	420,337	490,255	1,004,970	2,777,345	6,732,518	3,124,605	1,294,527
Received by industry, dried bauxite equivalent	•								
Domestic	484,584	327,411	391,256	503,102	1,050,130	2,742,300	6,661,583	3,022,139	1,213,253
Alumina	234,613	161,513	180,329	239,897	597,607	1,682,199	2,857,553	1,122,760	485,182
Chemicals	88.648	70,952	89,080	90,645	158,294	174,826	270,873	142,829	108,672
Abrasives	152,151	83,568	92,205	144,276	237,980	251,497	289,387	234,231	195,259
Other uses	9,172	11.378	29,642	28,284	56,249	49,138	48,664	29,725	44,402
Stockpiles						584,640	3,195,106	1,492,594	379,738
Imports	568.314	510,376	582,601	705,098	1,250,532	990,323	1,726,961	622,325	825,530
Exports	235,936	101,182	96,925	134,462	244,934	329,477	592,300	236,154	174,864
Available supply	816,962	736,605	876,932	1,073,738	2,055,728	3,403,146	7,796,244	3,408,310	1,863,919
Consumption		• • •			1.928.052	2.820.524	5.332.150	3,874,932	2,721,895

^{*}As shipped, including crude, dried and calcined.

ite in the years 1941–45—an amount greater by half than all the preceding output which had been recorded from 1889 through 1940.

In these five years the United States accounted for 40% of the world's total bauxite output, as compared with 10% in the five years preceding.

Imports also rose to levels never before attained, but in 1941-45 imports averaged only 36% of the domestic output, instead of 25% greater, as had been the case during the preceding five years.

Of the total production of bauxite in the United States in 1941-45, the production of metal took 46%, and emergency stocks absorbed 38%; eliminating stocks, and considering only that actually consumed, the division was 75% for metal, 13% for abrasives, 9% for chemicals and 3% for other uses.

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(G. A. Ro.)

Beans, Dry

World bean production increased steadily from 1936 to 1946, reaching a total of nearly 90,000,000 one-hundred-lb. bags in 1945. The greatest increases were in the United States and Brazil, which together produced nearly half the world's crop. Other important dry bean producing countries were Egypt, Italy, Rumania, Spain, Mexico and

Youthful volunteers of Salisbury, Md., helping to harvest the bean crop in 1943

France. Only small quantities were exported by most of these countries, however.

As the traditional army food, beans accounted for a large part of the increase in U.S. food production during World War II. There had been a general upward trend. in bean production after 1909 in the U.S., although prices were erratic. A poor crop in 1936 pushed prices to the highest point in five years, but in 1937 better yields brought production up to a new record and prices declined. With the outbreak of World War II acreage expanded, yields were good and total production reached a high point in 1943 almost double that of 1936. The crop of 1943 was estimated at 19,433,000 one-hundred-lb. bags (cleaned basis), which compared with less than 10,000,000 bags raised in any year before 1929 except one, 1925. In 1944 a lower yield per acre reduced production to about the average of the ten years 1934-43, or about 16,000,000 bags. In 1945, acreage dropped about 25% and although the yield was good the crop was the smallest after 1936. The need was estimated to be smaller, and the goal for 1946 was set at 15,000,000 bags by the U.S. department of agriculture.

Noncivilian requirements took about one-third of the output in 1943 and 1944. Exports increased from about 88,000 bags in 1937 to 1,545,000 bags in 1940 and to 2,870,000 bags in 1942. The demand for military purposes declined with the reduction of the armed forces and was estimated to be only 1,800,000 bags for the 1946-47 season.

Prices to producers of beans advanced from \$3.10 per 100 lb. in 1937 to a high of \$6.15 per 100 lb. in 1944 and to \$12.50 in November 1946. In 1917 a top of about



U.	S. Dry Be	an Prod	uction by	Leading aas of 1	States,	1937–46	•	
	1937	1939	1941	1942	1943	1944	1945	1946*
U.S. Total Michigan California idaho	15,582 4,333 5,369 1,836 781 649 1,264 231 252 681 45 80	14,388 4,850 3,990 1,501 1,420 460 1,134 154 207 504 25 91	18,503 5,267 5,139 284 1,880 840 1,453 432 284 1,236 60 103 60 38	18,963 5,212 5,169 2,234 1,903 1,024 1,436 560 338 1,029 68 83 40 54	20,922 5,121 3,843 2,600 2,865 1,344 13 920 577 768 84 65 44	16,059 4,158 3,843 2,175 2,088 1,201 731 588 250 722 64 38 40 48	13,085 2,977 3,559 1,725 1,572 1,572 1,575 714 730 234 290 67 33 50	15,797 3,841 3,587 2,142 1,618 1,305 1,428 992 322 308 117 49 43 24
Minnesota .	14	ģ	22	28	50	40	24	15
*Preliminary est †Not reported :		y•"						

\$10.00 per 100 lb. was reached for a short time, followed by a drop to about \$4.00 per 100 lb. in 1920. The price of beans was supported by the Steagall law at 90% of parity, a control which was to continue for two years after the official end of the war. (See also VEGETABLES.)

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Beaverbrook, William Maxwell Aitken

Baron Beaverbrook (1879-), British publisher and statesman, was born May 25, 1879, the son of a Scotch Presbyterian minister who lived at Newcastle (New Brunswick), Canada. Educated in Newcastle public schools, he started his career in journalism as a newsboy. He later entered business, formed a successful merger that netted him a fortune and then went to London. There he entered politics and was elected member of parliament in 1910 for Ashton-under-Lyne. He served with the Canadian expeditionary force in France in 1915, was elevated to the peerage as Lord Beaverbrook in 1917, and was appointed chancellor of the duchy of Lancaster and minister of information in 1918. Meanwhile, he bought (in 1917) a controlling interest in the London Daily Express and by 1930 had built up the paper's circulation to more than 2,500,000. He also became publisher of the Sunday Express and the Evening Standard. Lord Beaverbrook entered the Churchill coalition cabinet on May 14, 1940, as minister of aircraft production. Criticism of his work led to his removal and on June 29, 1941, Churchill named him minister of supply. Lord Beaverbrook represented Britain at the U.S.-British-Soviet parley that opened in Moscow, Sept. 29, 1941. After his nomination, in Feb. 1942, to the newlycreated ministry of production, Beaverbrook served 15 days and then left for "reasons of health." He then actively stumped for aid to the U.S.S.R. and a prompt opening of a "second front." In Sept. 1943, Beaverbrook returned to the Churchill cabinet as lord privy seal. In the summer of 1944, he headed the British delegation that conferred in Washington, D.C., with U.S. officials on joint Anglo-U.S. policies on world oil resources. He was opposed to both the Bretton Woods agreement and the British loan from the U.S. on the grounds that they would threaten the economy of the empire.

Bechuanaland Protectorate

See British South African Protectorates.

Beck, Josef

Beck (1894-1944), Polish statesman, was born Oct. 4, 1894, in Warsaw. He enlisted in Joseph Pilsudski's Polish legion in 1914 and served on the Polish general

staff during the conflict with Russia in 1919-20. Beck was military attaché in Paris, 1922-25, and in 1932 became foreign minister in the Pilsudski cabinet. This post he retained until the German invasion in 1939. As Hitler's armies overran Poland in Sept. 1939, Beck fled to Rumania with other members of the Polish cabinet. Although interned in Rumania, he was said to have exerted longdistance pressure on Polish officialdom in London, and his strongly anti-soviet clique in the Polish government-inexile was said to have had considerable influence in blocking Polish-soviet rapprochement. Beck's influence in London waned considerably, however, when Wladyslaw Sikorski and later Stanislaw Mikolajczyk headed the Polish cabinet. Beck died June 6, 1944, near Bucharest, according to a broadcast by a nazi-controlled radio station in Rumania.

Beef

See MEAT.

Beekeeping

The production of U.S. honey had been declining for several years prior to World War II, and the average was about 160,000,000 lb. annually. The number of beekeepers in the U.S. was estimated at about 800,000 and the number of colonies 4,500,000. It had become a widely distributed agricultural enterprise, called a \$10,000,000 industry. The principal causes of the decline were the low prices, droughts and the reduction in buckwheat pasture for the bees. With increased demand for honey to replace sugar and its wider use in industry, production increased to 180,000,000 lb. in 1942, and to a high total of 225,779,000 lb. in 1945. The average production per colony was

Women volunteers working at beehives during World War II, when replacements were needed for male workers on leave for military duty or defense work



41.3 lb. and the number of colonies was reported at 5.566,000—24% above the low year 1939. Prices were well sustained because of the shortage of sugar. A large proportion of the crop was used by industry in baking, ice-cream and syrups.

Honey Production in the United States, 1939-46

								1··· F-	4,								
								180,474,000	1943								189,867,000
1940	٠	•	٠	٠	٠	٠		205,767,000									188,917,000
								221,959,000									225,779,000
1942	٠	٠	•	•	•	٠	٠	177,672,000	1946	٠	•	•	٠	٠	٠	٠	213,814,000

The price of honey at principal wholesale delivery points doubled between 1937 and 1946. Comb honey brought an average of \$3.64 per case in 1937 and \$5.40 in 1943. Extracted honey, California white orange, was 61/4 cents per lb. in 1937 and 12 cents per lb. in 1943. The prices varied greatly between regions and states. For example, the average price received by beekeepers in 1943 in New Hampshire was 29.4 cents per lb.; in Connecticut it was 17.1 cents, while in the western states the price ranged from 19.3 cents in Oregon to 13.4 cents in California.

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Beer

See Brewing and Beer.

Beetles

See Entomology.

Beets

See Vegetables.

Beet Sugar

See SUGAR.

Belgian Colonial Empire

Situated in equatorial Africa, the Belgian colonial empire consists of the colony of Congo and the adjacent mandated territories of Ruanda and Urundi. It has a narrow access to the Atlantic ocean on the northern shore of the Congo river estuary, but otherwise is surrounded by French Equatorial Africa in the W. and the N., by British possessions in the W. and the S.W., and by Portuguese Angola in the S.E. Total area: 923,270 sq.mi.; total pop. (est. Jan. 1, 1946): 14,336,000 (33,787 whites including 23,506 Belgians).

Congo.—Area: 902,040 sq.mi.; pop. (1939 census): 10,304,084 including 10,278,875 natives; (est. Jan. 1, 1946) 10,491,000 including 10,459,000 natives. In 1939 there were in the Belgian Congo 24,615 Europeans, including 17,536 Belgians, 1,543 Portuguese, 1,483 Italians, 1,041 British, 767 Greeks, 658 Americans, 489 Dutch, 415 French, etc. The Europeans in 1938 included 1,946 officials, 3,284 Christian missionaries, 5,346 employees of companies and 2,016 settlers.

On Jan. 1, 1946, the white population was estimated at 31,787 of whom 22,306 were Belgians; this European population included 3,287 officials, 3,837 Christian missionaries, 8,683 employees of companies and 2,773 settlers. Chief towns (1938 census): Léopoldville (cap., 30,582 natives, 2,315 Europeans), Elisabethville (36,422 natives, 2,572 Europeans), Jadotville (17,354 natives, 1,084 Europeans), Stanleyville (9,388 natives, 610 Europeans); on Jan. 1, 1946, the pop. of Léopoldville was estimated at c. 120,000 natives and 5,385 Europeans. Languages: Kis-

wahili is spoken by the natives who have been under Arab influence, Bangala and Kigwana are the languages on the Upper Congo, Kikongo is used near the coast, Tshiluba in the south and Lomongo in the central regions. Religion: mainly fetishism. Governors: Pierre Ryckmans (Sept. 1934–July 1946); Eugene Jungers (appointed Dec. 31, 1946).

Ruanda-Urundi.—Area: 21,230 sq.mi.; pop. (est. 1938): 3,752,742; (est. 1946) 3,845,000. In 1938 there were 932 Europeans including 609 Belgians; the Europeans included 143 officials, 307 Christian missionaries, 140 employees of companies and 46 settlers; in 1946 the white population was estimated at c. 2,000 including 1,200 Belgians. The territory is populated by three races: the Batutsi, the Bahutu and the Batwa. Chief town: Usumbura (cap., no census taken). The territories of Ruanda and Urundi were united administratively with the Congo, under the direction of a vice-governor, a post occupied by M. Jungers throughout the decade 1937–46.

The foundations of the big economic development of the Belgian Congo were laid mainly between the years 1918 and 1930. It was during that period that all the existing railways were built, the port of Matadi was modernized, the first motor roads laid out; it was also during that period that new cultivations and industries were started: cotton, coffee, oil palm and rubber plantations, cotton mills, sugar and cement factories, numerous oil mills, breweries, etc. After 1930, and during six years, the Belgian colonial empire felt heavily the effect of the world depression; public expenses had to be drastically curtailed, the number of officials reduced; numerous young enterprises were not able to survive and many other had to be assisted financially by the government. This situation improved from 1937 onwards through an increase in the world prices for tropical produce.

In World War II.—After outbreak of World War II the Congo—like Belgium—remained neutral for eight months, the communication between Belgium and the colony becoming, however, increasingly difficult. On the invasion of Belgium by Germany, the Congo entered the war. But, very quickly after the capitulation of the Belgian army, the Congo was completely severed from the mother country. The governor general, Pierre Ryckmans, kept the Congo in the war on the side of the Allies. Soon, however, the economic situation became critical; in anticipation of the war, large stocks of imported goods had been made, but nobody bought the produce by which the Congo had to live. Production was brought to a standstill.

At the end of 1940, Great Britain sent to the Congo an economic mission headed by Lord Malcolm Hailey whose negotiations led to the conclusion of a financial and economic agreement. The Congo entered the sterling area; any surplus of gold or foreign exchange above the requirements of the Congo and of the Belgian government in exile was to be sold against sterling to the British government. Great Britain undertook to buy fixed quantities of the main Congo produce at agreed prices. The rate of exchange of the Congolese franc was maintained at 176.50 fr. to the £. Immediately after this agreement was concluded, production started again. After Pearl Harbor, when the far east was lost and with it the main supply source of the most valuable raw materials, the importance of the Belgian colonial empire increased. A civil mobilization was ordered, and the production of strategic war materials increased to the utmost.

The war effort of the Belgian colonial empire yielded

appreciable results in stimulating agricultural and mineral production. At the same time, as no one could predict when the war would end, oil palm plantations were extended from 185,250 to 294,400 ac., and rubber plantations from 49,400 to 180,300 ac.

At the outbreak of World War II the Belgian colonial empire had a small military force of some 15,000 men. This was expanded to 35,000 men. In 1941, an expeditionary force was sent to Ethiopia, and assisted the British army and the Ethiopian partisans in the liberation of the country; they won the victory of Saio, where 15,000 Italians with 9 generals surrendered to the small Belgian force of 2,000 men.

In 1942, a fully equipped expeditionary force of some 12,000 men was sent to Nigeria, in order to assist in the

В	elgian Colonic	ıl Empire: Statıst	rical Data	4.4
Item	Value (000's omitted)	Amount or Number	Value (000's omitted)	Amount or Number
Exchange rate United States		1 Belgian franc =3.4 cents	:	1 Belgian franc
Great Britain		140 francs = £	1	=2.3 cents 176 5 francs =£1
Belgian Congo Finance				
Government revenues	\$24,690 (£5,050)		\$40,364 (£10,003)	
Government revenues Govt. expenditures	\$25,737 (£5,264)		\$36,608 (£9,703)	
National debt	\$149,772 (£30,634)		•••	
Transportation Railroads Navigable waterway: (rivers) Communication	s	2,993 mi. 7,320 mi.		
Telephones Telegraph lines Radio sets		1,440 4,209 mi. 2,147		2,650 3,427 mi. 5,850
Minerals Copper Gold Tin		136,622 tons 518,527 oz. 11,095 tons		163,327 tons* 646,424 oz.* 13,879 tons*
Crops Palm nuts Palm oil Rice Corn Manioc		97,739 tons 77,443 tons 66,579 tons 26,184 tons		77,161 tons 132,276 tons 82,673 tons 154,322 tons 5,257,971 tons
Forest products Copal gum		16,660 tons		
Logs Exports—total	\$64,101	46,160 tons 601,000 tons		4,323 tons
Copper	\$64,101 (£13,111) \$17,281 (£3,535) \$13,918 (£2,847)	177,000 tons		
Gold	\$13,918 (£2,847)	450,000 oz.		
Cotton (raw)	\$7,403 (£1,514)	46,000 tons		
Imports—total	\$7,403 (£1,514) \$34,553 (£7,067) \$6,336	344,000 tons		
Machinery	\$6,336 (£1,296) \$3,526 (£721)	12,000 tons		
Cotton cloth Vehicles and parts	(£721) \$3,213	5,000 tons 8,000 tons		
Ruanda-Urundi	(£657)	0,000 10113		
Finance Govt. revenues	\$1,613			
Govt. expenditures.	(£330) \$1,426 (£292)			
National debt	(£292) \$5,075 (£1,038)			
Transportation Highways Minerals		3,828 mi		
Cassiterite Gold		1,545 tons 19,098 oz.		2,089 tons 3,987 oz.
Crops Potatoes		205,028 tons		•••
Livestock Cattle		970,000 960,000		888,288 1,072,409
Exports—total	\$2,193 (£449)	•••	\$10,563 (£2,618)	585,000 tons
Tin ore (cassiterite) Coffee	\$767 (£157 \$642 (£131)	(£2,618) \$671 (£166) \$314 (£78)	9,000 tons 16,000 tons
Gold	\$767 (£157 \$642 (£131 \$436 (£89) \$1,953 (£399)	13,661,000 for	ns ···	•••
Textiles Motor lorries and	\$781 (£160)	•••		
fractors *1940.	\$75 (£15)	•••		

liberation of French West Africa. In 1943, after the invasion of northern Africa and the surrender of French West Africa, this force was sent to the middle east, and kept ready to assist in the liberation of Europe. In 1944, however, objections were raised against the use of Negro troops in Europe, and the Belgian expeditionary force was sent back to the Congo.

World War II had a profound influence on the Congo. On the one hand, it stopped for six years any extension of educational and medical programs. On the other hand, it accelerated in many respects the pace of the evolution of the Congo, both as regards white settlers and natives. Europeans, cut off for six years from their respective mother countries, considered the Congo as their home more than previously, and were asking for a larger share in the administration of the colony. The natives, despite German propaganda between 1940 and 1942 magnifying the military successes of the axis, remained absolutely loyal and co-operated wholeheartedly in the war effort. But those who had received some education, and mainly those living in large cities, became more self-conscious.

Postwar Period.—At the beginning of 1945, there were in the Congo and in the territories of Ruanda and Urundi 290 doctors, 135 European sanitary agents, 338 sisters and nurses, 557 native medical assistants, male and female nurses and midwives. The death rate among Europeans in 1944 was only 7.48 per 1,000, despite a much larger number of women and children, and, for many people, a prolonged stay in the tropics.

At the beginning of 1946, new social legislation was introduced. For white employees a system of old age pension, pension in case of invalidism and of compensation in case of accidents, was introduced. For the natives, professional trade unions and various bodies in which native workers and European managers could discuss together all problems relating to native employment were organized.

It was decided to reorganize the Congo administration on a principle of decentralization. The public expenses of the Congo increased considerably: the budget estimate for 1947 amounted to B.Fr. 2,500,000,000. Industry was developing fast. The opening was foreseen in 1947 of a number of factories. A central institute for high scientific research was about to be established. European settlement was encouraged and assisted, mainly in the more healthful southern and eastern areas. The formerly mandated territories of Ruanda and Urundi were placed under trusteeship of the United Nations.

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Belgian Congo

See Belgian Colonial Empire.

Belgian Literature

One cannot say that a particular man or a particular work made any marked impression during the decade 1937-46; but writers abounded. Where they succeeded best was in poetry, monographs and the essay. The novel and drama showed less assertion. Nevertheless, certain dramatic works seemed to sound a new note, for instance Godefroid de Bouillon (Herman Closson), La Matrone d'Ephèse (Georges Sion), Le Burlador (Suzanne Lilar). Some novels also should be recorded: Printemps chez les Ombres (Alexis, Curvers), Panique en Occident (José-

André Lacour), Marais (Dominique Rollin), L'Egrégore (Pierre Nothomb), Françoise ou la Mort des Amants (Arnold de Kerchove), Week-end aux Tropiques (Adrien de Meeüs), La citadelle Bauduin (O. P. Gilbert). The best of the poetical production of 1930-40 was brought together in the Anthologie de la Décade. It can be said that the decade 1937-46 was one of great Belgian poetical activity, but nothing of surpassing merit was published.

Among many books of essays and historical subjects the following were noteworthy: Mahomet et Charlemagne (Henri Pirenne), Le Grand Héritage (Luc Hommel), Les Droits de la Cité (Henri Haag), Joseph Lebeau (Fernand Daxhelet), Les Eternels (Gaston Colle), Guillaume de Saint-Thierry (Dom Déchanet), Erasme (Marie Delcourt), Léopold III (G. H. Dumont). Among books of meditation, controversial and mystical, the following were outstanding: L'Incarnation de l'Homme (Marcel de Corte), Dialogue de l'Homme et de Dieu (Canon Leclercq), L'Oeuvre de Rome (Roger Goossens). Four books of criticism should not be omitted: L'Ecole de Laethem-Saint-Martin (Paul Hassaerts), Gustave De Smet (P. G. Van Hecke and E. Langui), L'Elément Flamand dans Beethoven (Ernest Closson) and Le Théâtre, cet Inconnu (Herman Closson). Few accounts of travel appeared; one should mention nevertheless Sur la Crête des Andes en Auto (Hubert Carton de Wiart), Les Bêtes Sauvages de l'Amazone and Le Mystère de l'Orénoque (Marquis de Wavrin).

The booksellers' demands were closely associated with the publishers' activities. To the enterprise of such already old firms as Desclée de Brouwer, Renaissance du Livre and the Office de Publicité was added that of new firms or of firms under a new name such as Presses de Belgique, Editions Dessart, Solédi, Casterman, Editions Lumière, Editions de la Sixaine, etc. These firms increased the number of anthologies and translations. Some of them had business connections with publishers in Paris and issued editions jointly with them.

Most of the Belgian reviews changed during World War II into "collections" or anthologies among which should be mentioned the following: Bâtir, Vivre, Collection Nouvelle des Classiques, Collection Lebègue, Collection Nationale and Saints de Nos Provinces. These brought about an astounding increase in the number of monographs, biographies, re-editions of French and foreign classics, popular pamphlets on history, science and religion—nearly all of extremely good appearance and decidedly useful.

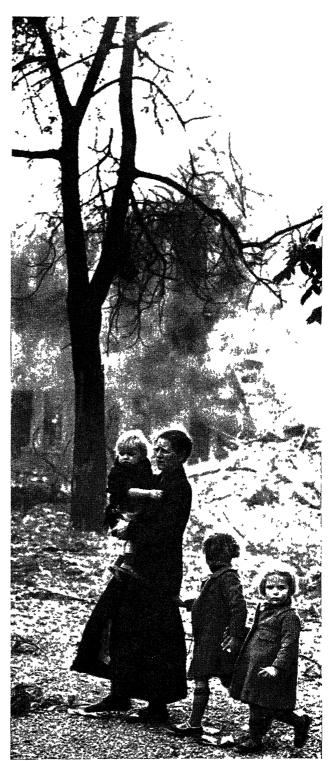
After the liberation certain old reviews reappeared: Le Thyrse, Cahiers du Nord and Etudes Carmélitaines. Others were transformed like the Revue Générale Belge which was the result of the fusion between the old Revue Générale and the Revue Belge, and new reviews were launched such as the Revue Nouvelle, Construire, Carnet du Séminaire des Arts, La Maison, Architecture and Solstice (quarterly articles on literature).

The works of writers such as Georges Simenon, Charles Plisnier and Henri Michaux were more properly connected with Parisian literature.

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Belgium

A nation of western Europe, Belgium is bounded on the west by the North sea, on the north and east by Holland, on the east by Germany and the Grand-Duchy of Luxembourg and on the south and west by France. Area: 11,775 sq.mi.; Pop. (1937) 8,361,220; (May 31, 1946) 8,355,232. Chief towns (1945): Brussels: (cap. 1,282,438); Ant-



Belgian children clinging to their bewildered mother after being bombed out during a German air raid in May 1940

werp (767,619); Liége (534,725); Ghent (435,278); Mons (247,812); Namur (209,080). Languages: Dutch, French and German. Religion: Christian (chiefly Roman Catholic). Head of state: King Leopold III, Prince Charles acting as regent after Sept. 20, 1944. Prime ministers: Paul van Zeeland (June 13, 1936–Oct. 25, 1937); Paul-Emile Janson (Nov. 24, 1937–May 15, 1938); Paul-Henri Spaak (May 15, 1938–Feb. 9, 1939); Hubert Pierlot (Feb. 21, 1939–Feb. 7, 1945); Achille van Acker (Feb. 12, 1945–July 16, 1945, and Aug. 2, 1945–Feb. 18, 1946); Paul-Henri Spaak (March 13,



Belgian priests crossing a bridge destroyed by the demolition squads of retreating Germans, at Namur, Belgium. Namur was liberated by the Allies early in Sept. 1944

1946–March 21, 1946); Achille van Acker (March 31, 1946–July 9, 1946); Camille Huysmans (after Aug. 2, 1946).

Policy of "Independence."-Belgium in the year 1937 adopted an entirely new foreign policy. Actually, it was on Oct. 14, 1936, that King Leopold III had called together his ministers in order to inform them of his anxiety in face of certain facts of more and more agonizing significance: the extraordinary rearming of Germany, the transformation of the methods of warfare, the reoccupation of the Rhineland, the failure of all the international covenants and of the League of Nations. Winding up this memorable speech, the sovereign had proposed to his government the return to a foreign policy which should be "completely and exclusively Belgian," likewise the creation of a military instrument strong enough to deter any would-be invader. The change of policy recommended by the king had been approved by his ministers unanimously. These, in their turn, had received the solid support of the chamber, on Oct. 28, 1936, by 126 votes to 42.

The British and French governments were quick to recognize the absolute legitimacy of the new international position adopted by Belgium. On April 24, 1937, an offi-

cial document was handed to Paul-Henri Spaak by Jules Laroche, the French ambassador, and Sir Esmond Ovey, the British ambassador. By this instrument, France and England freed Belgium from her obligations resulting from the Treaty of Locarno and other agreements, while at the same time maintaining their promise of assistance in case of invasion. After a series of discussions which lasted several months, on Oct. 13, 1937, the third reich made a declaration similar to that of the French and English. Thus, the so-called policy of "independence" found itself confirmed on the international plane.

Internal Foment.—Completely united so far as the foreign policy of their country was concerned, the Belgians were not so united in internal politics. It was the pro-fascist Rexists who opened hostilities. By provoking a by-election in Brussels, Léon Degrelle tried to measure his strength with that of the prime minister, the candidate for all the other parties. On April 11, 1937, Paul van Zeeland obtained 276,000 votes, while his opponent collected only 69,258. Patently, the Rexist party was disintegrating. But Van Zeeland soon had to face a second attack, brought on by certain unusual operations carried out at the National Bank. Finding himself involved, and in order to defend himself more easily, he resigned on Oct. 25, 1937. A prolonged crisis ensued. On Nov. 24, Paul-Emile Janson managed to form a three-party ministry which remained in power till May 15, 1938.

On that date, Paul-Henri Spaak took over from his uncle. The economic position of Belgium was far from flourishing. The upward movement in trade and industry recorded unvaryingly between 1935 and 1937 had ceased. Between 1937 and 1938 exports dropped from 25,500,000,000 to 21,724,000,000 Belgian francs. The production of cast-iron and ferrous alloys went down from 4,180,000 short tons to 2,750,000, while that of steel fell from 4,290,000 short tons to 2,530,000. In the Belgian Congo the production of copper and manganese declined in like proportions. As for unemployment, by the end of 1938 it had increased by 38%.

The causes of this retrogression lay in the creation of autarchies and closed economic boundaries, as also in the threats of a second world war. These threats became dangerously acute in Czechoslovakia and absorbed the whole attention of Spaak. In Sept. 1938 the Belgian government undertook a partial mobilization and the placing on a war-footing of 12 infantry divisions. Belgium remained calm, the franc maintained its value and the storm passed. This lull perhaps deceived the political parties, which started to quarrel over the recognition of the Spanish government of Burgos. On Jan. 21, 1939, Spaak reconstructed his government, by strengthening the influence of the Catholics at the expense of the Liberals. The latter replied by criticizing the appointment to the Flemish Academy of Medicine of Dr. Maertens, who had been actively pro-German during World War I. The matter was sufficiently serious for the king to find himself compelled to summon his ministers in order to remind them of the regular free-play of parliamentary institutions. On Feb. 9, 1939, Spaak's government fell.

Hubert Pierlot attempted to form a Catholic-Socialist cabinet, but he had to give up the project after a week. Belgium could, literally, no longer be governed. On March 6, the king signed a decree dissolving the chambers and fixing elections to the legislature for April 2. At the same time he appealed to the good sense of the Belgian people and invited them to look beyond their own frontiers. The elections of April 2 went very much in favour of the parties representing order. The Catholics obtained 73

seats (+10) and the Liberals 33 (+10), whereas the Socialists dropped to 64 (-6) and the Rexists to 4 (-17). The Communists maintained their position (9 seats) and the Flemish Nationalists improved theirs by only one seat (17) in all).

Following the indications on the part of the electors, Pierlot formed, on April 18, 1939, a Catholic-Liberal ministry. By 104 votes to 84 he was granted special powers of which he made skilful use. The budget prepared for the fiscal period 1939–40 was balanced and 5,000,000 francs in gold, which had left the country in 1938, were returned to Belgium. The index of industrial production rose from 86% to 111%.

International events interrupted this welcome readjustment. In Aug. 1939 the Belgian government hastily recalled certain special units to the colours. On Aug. 23, the U.S.S.R. and Germany signed a "non-aggression" pact. A day later in the name of all heads of state belonging to the Oslo group (Denmark, Finland, Luxembourg, Norway, Holland, Sweden and Belgium), whose foreign ministers had assembled in Brussels, King Leopold III addressed to public opinion throughout the world an appeal in favour of a "peace based on respect for the rights of all nations." The British, French and U.S. governments expressed their liveliest sympathy with this message to which, by contrast, Germany, Italy and the U.S.S.R. made no reply. On the evening of Aug. 28 the catastrophe seemed imminent. Queen Wilhelmina of Holland and King Leopold tendered their "good offices" to Britain, France, Poland, Germany and Italy, whose ambassadors were summoned in turn by Mr. Pierlot, in Brussels, and by Eelco Nicholaas van Kleffens, at the Hague. But Germany had already decided on war; on Sept. 1 her troops were invading Poland.

Eight Months of Neutrality.—The attitude of Belgium towards the conflict was clearly indicated; it proceeded entirely from that "policy of independence" adopted in 1936. It left no occasion for the slightest misunderstanding. As early as Sept. 3, the Belgian government made a declaration of neutrality, summarizing the obligations laid upon her by international law. On the same day the king requested Pierlot to broaden his ministry by bringing into it five socialists. Belgian neutrality was in complete accord with the defensive plans of Britain and France. It gave these two countries time to catch up with the considerable start which they had allowed Germany to be given in the field of armaments. Furthermore, the Belgian government did not remain inactive. It mobilized 650,000 men, or approximately one-eighth of the population, and increased the fortifications. Besides this, the army general staff made direct contact with the commander in chief of the Franco-British armies, in order to make certain that the latter had all the necessary data at his disposal, in case of an eventual armed intervention. Nevertheless, in accordance with her obligations as a neutral state, Belgium rejected the French demands to open immediately her frontiers to the Allied troops.

On April 16, 1940, in the senate, the foreign policy of the government was approved by 131 votes as against 3 hostile votes coming from the Communists and 2 abstentions. Such evidence of unanimity was not repeated with the same force in regard to internal matters. On April 25, the Liberal deputies voted against the budget for the ministry of public education, for reasons of a linguistic nature. The Liberal ministers took the negative vote on the part of about 20 of their political confrères as reflecting a personal lack of confidence. Without having been outvoted in parliament, the prime minister tendered his

resignation to the king. But Leopold III refused categorically to accept it. "The present time"—he wrote to Pierlot—"is not a suitable one for an open ministerial crisis on questions of internal politics." Four days later Hitler started his blitzkrieg.

Eighteen Days' Campaign.—At dawn on May 10, 1940, without an ultimatum or declaration of war, the German armies invaded Belgium. Their first attacks were launched against Limburg, to the west of the lower Meuse. They were accompanied by violent bombardments and large-scale dropping of parachutists.

On the covering line of the Albert canal, the Belgian troops held out until the arrival of the Allied expeditionary corps. They then withdrew, as prearranged, to the real line of defense K./W. (Konigshoycke-Wavre), where a junction of the forces was effected, the latter resting on the Escaut, the Dyle and the Meuse south of Namur. However, on the night of May 14–15 the hinge-point of Sedan collapsed under the pressure of the German armoured divisions, which immediately began to race towards the sea. The Belgian front was left dangerously exposed. Owing to the defeat of the French at Sedan, Leopold III was forced to order the highly-fortified line K.W. to be abandoned in favour of improvised defense positions. This was done with the approval of General Maurice Gamelin, then commander in chief of the Allied land forces.

Between May 15 and 17 the Belgian army carried out its withdrawal while engaging the Germans. Then, having taken up strong positions along the Escaut and the Ghent bridge-head, it kept in check the incessant attacks of the enemy. During three days, in spite of the absence of any Allied air support, it annihilated several German units.

Unfortunately, in northern France the disaster became accentuated. On May 21 the Germans reached Abbeville on the Somme. Day by day, hour by hour, the vise tightened its grip around the isolated Belgian army. As far as the latter was concerned, the war was lost; but the king held that he was in honour bound to continue resistance, in order to allow for the withdrawal of the French 6oth division and the evacuation of the British troops-nucleus of what was to become the army of liberation. On May 27, after having warned the Allied general staffs of his intention, the king, as commander in chief of the Belgian army, decided to send a deputation to the German high command to negotiate a truce. The situation was, moreover, strictly untenable. Hitler exacted unconditional surrender. The treaty of capitulation, signed on May 28 by General Hans von Reichenau for the German army and General Olivier Derousseaux for the Belgian army, carried with it only stipulations which were exclusively military. It concerned solely the troops which were surrounded. (See WORLD WAR II.)

Bondage.—King Leopold III did not wish to abandon his army, of which he was, according to the constitution, the commander in chief. He considered himself a prisoner of war and refused categorically to take any political decisions. On the other hand, his ministers had in most cases gone abroad. There was thus an absence of executive power. By virtue of an enactment of May 10, 1940, concerning the delegation of authority, the heads of department in the various ministries immediately assumed the administrative direction of the occupied country. On June 2, 1940, a senior German officer informed the heads of department of the appointment of General Alexander Ernst von Falkenhausen as governor general of Belgium and northern France. General Eggert Reeder was attached



Moving toward the Rhine, infantrymen of the U.S. 1st army advanced through snow-covered forests of Belgium during the winter of 1944

to him as president of the Militärverwaltung.

The history of the ensuing years could be summed up in four words: famine, arrests, deportations, assassinations. From the very beginning, and under a mask of correctitude, the Germans pillaged Belgium of her stocks of supplies and economic riches. Moreover, Belgian agriculture was incapable of supplying the 2,750,000 short tons of cereals annually imported before the war. Week by week, the state of health of the population deteriorated in an alarming manner. By way of example, the charitable organization known as "Winter Help" had to assist 1,768,000 inhabitants-or approximately one-fifth of the Belgian population. By going personally to Berchtesgaden on Nov. 19, 1940, King Leopold III extracted from Hitler a substantial improvement in regard to food supplies. This improvement was maintained, with various ups and downs, right to the end of the occupation.

Meantime, on May 12, 1940, General von Falkenhausen had issued a decree fixing the age-limit of civil servants at 60, instead of 65. This decision gave the Germans the opportunity of introducing their own men (mostly Rexists and Flemish Nationalists) into the highest departmental positions, as well as into the various branches of the administrative machinery. Then began the first arrests of hostages

and recalcitrant patriots, the regulations concerning forced labour (March 6, 1942) and the deportation to Germany of the 1920–24 classes of recruits (March 6, 1943). Once more, on this occasion, a violent protest by the king softened the harshness of the orders. Leopold III secured, in fact, the cancellation of those affecting the deportation of women, young girls, children belonging to prisoners of war and war orphans. Five hundred thousand Belgians thus escaped a dreadful fate.

The more clearly the outlines of an Allied victory began to shape themselves, the more heavily did the nazis bring their terror to bear on the Belgians. Patriots were taken away, in thousands, to torture and extermination camps. The royal family itself was not spared. On June 7, 1944, the king was arrested by the S.S. and taken off to Germany. Two days later, Princess de Réthy (with whom the widowed king had contracted a second marriage) and the royal children suffered a like fate. On July 13, 1944, General von Falkenhausen was replaced by the Gauleiter Joseph Grohé. The latter seemed determined to drown Belgium in a bath of blood. With his encouragement, those collaborating with the gestapo, Rexists, ex-legionaries against Russia and other traitors vilely assassinated dozens of prominent people. Fortunately, the armies of the Allies did not allow the S.S. and their hired assassins time to carry their plans to completion. With the enthusiastic support of the forces of the

resistance, under the leadership of General Yvon Gérard, the Allied armies put the Germans to flight. After 1,600 days of bondage, Belgium found herself again in possession of her sovereign independence.

To V-E Day.—On Sept 8, 1944, the Pierlot government returned to Brussels. It had been formed in London in Oct. 1940 with the object of organizing and increasing Belgium's contribution and that of her colonies to the war. Its efforts were not in vain: the economic support furnished by the Belgian Congo, for example, proved to be of the utmost value to the cause of the United Nations. The latter testified to the fact on several occasions. On Sept. 20, 1944, taking into consideration the fact that the king was held a prisoner by the Germans, both chambers in joint session elected his brother, Prince Charles, to the regency of the kingdom. A week later, Pierlot reshuffled his cabinet by bringing into it Belgians who had remained in their country.

The first task before the new government was the reabsorption of the inflated currency created by the Germans—the fiduciary circulation had increased from 28,000,-000,000 to 119,000,000,000 Belgian francs. On Oct. 9, 1944, Camille Gutt, the finance minister, effected a deflation on a vast scale, which rapidly brought down the notes' circulation to 21,000,000,000 francs. This reduction was, however, attenuated by two successive issues, but its effect was to stabilize the currency. The experiment carried out by Gutt was, unfortunately, warped by a sudden flare-up of the war. On Dec. 16, 1944, General Gerd von Rundstedt launched a violent offensive in the Belgian Ardennes, while the cities of Liége and Antwerp were subjected to murderous bombardments by flying bombs and rockets. The requirements of war naturally came before those of economic recovery. The new Belgian army which had just been raised took part in numerous battles against the enemy at bay. Accused of want of vigour and understanding, the Pierlot government resigned on Feb. 7, 1945, without even awaiting the verdict of parliament. On Feb. 12, Achille van Acker formed a ministry from which were excluded all the "London men," except Spaak, who kept the ministry of foreign affairs. On May 7, 1945, Germany capitulated. The same day, it was announced that King Leopold III and his family had been liberated by the American 7th army.

Revival.—The immediate postwar period in Belgium was marked at once by an exceptional political instability and, at the same time, by an undoubted economic revival. On the initiative of the Communist party and of a proportion of the Socialists, a dispute involving the king was started. Lengthy discussions were entered upon between Leopold III and the government. The latter, having pronounced itself in favour of an abdication by the sovereign, found itself broken up on July 16, 1945, owing to the resignation of all the Catholic ministers. A long parliamentary debate then followed which brought no new suggestions but merely complicated the situation.

A ministry of the left, formed on Aug. 2, 1945, by Van Acker, began to disintegrate at the very beginning of 1946, following upon "differences of opinion on matters of essential importance." On Jan. 9, the prince regent signed a decree dissolving parliament and fixing elections for Feb. 17. On Feb. 18 Van Acker resigned. The elections modified to a considerable extent the composition of the chambers. The Christian Socialist party (heir to the Catholic party) won 92 seats in the chamber of deputies (+ 19), the Liberal party 17 (- 16), the Socialist party 69 (+ 5), the Communist party 23 (+14) and the Democratic Union 1. In the senate, the Christian Socialist party occupied 83 seats, the other parties together making up 84. Owing to various

constitutional questions (especially the one concerning the king), any possibility of an understanding between the strongest party (Christian Socialists) and the other parties was effectively ruled out. Three prime ministers—Spaak, Van Acker and Camille Huysmans—tried, in vain, to resolve the deadlock, but without success.

In spite of the incoherence of its political situation, Belgium carried out a course of reconstruction which could not be paralleled in any of the other states formerly under

=	•				•
	Belg	jium: Statistic	al D	afa	
	1	938		1	942
	Value (000's	Amount	or	Value (000's	Amount or
ITEM	omitted)	Number	•	omitted)	Number
Exchange rate					
United States .		1 Belgian			none
		Franc= 3.4 cents			available
Great Britain .		140 Francs	;		
		=£1			
Finance Government	¢1 020 3 / 0			£2 472 224	
revenues .	\$1,928,349 (£394,426)			\$2,472,324 (£612,720)	
Government	\$2,288,461			\$3,385,270	
expenditures	(£468,084)			(£838,976)	
Gold reserves	\$2,895,632			\$3,655,718	
National debt	(£592,275) \$9.686.107			(£906,002) \$19,093,531	
	\$9,686,107 (£1,981,204)			\$19,093,531 (£4,731,978)	
Transportation		7010			
Railroads		7,068 m 6,560 m			
Hıghways Navigable		0,500 111	•-		
waterways .		998 m	i.		
Airways		2 ,9 07 m	۱.		
Communication					
Telephones .		415,522			
Radio sets		1,002,045			
Minerals Zınc (smelter					
production).		222,334	tons		204,697 tons*
Copper (smelt-		•			
er production)		89,837	"		105 001 .
Lead (smelter production)		97,002			105,821 tons
Iron ore		199,428	"		124,339 "
Crops					
Fodder beets		5,066,501 3,591,734	tons		•••
Potatoes		3,591,734	"		2,502,772 tons†
Root crops		3,320,017	u		•••
Sugar beets . Grass (for hay)		3,320,017 1,324,524 1,155,982	"		•••
Livestock		• • • • • • • • • • • • • • • • • • • •			
Cattle		1,689,680			1,492,822†
Swine		960,372			444,622†
Horses Poultry		264,650			249,880† 2,035,186†
		•••			1,000,100
Sea Products- Total		43,139	tons		
Sole		3,682	41		
Sheilfish		3,467	"		
Plaice • • • • Skate • • •		3,379 3,790	**		
	\$2.470.045	•	ton-		
Exports‡ Total .	(£750.674)	24,259,000	10115		
Textile products	\$363,397 (£74,330) \$250,747	167,000	**		
	(£74,330)	0.01/.000			
Chemical and	\$250,747 (£51,288)	2,316,000			
pharmaceutical products	(2001,200)				
Machinery	\$221,113	162,000	**		
	(£45,227)				
Precious and semi-precious	\$181,642				
stones	(£37,153)	•••			
Imports-‡Total .		34,782,000	tons		
	(£800,522)				
Machinery	\$209,017	65,000	"		
Wheat	(£42,753) \$195,468	1,145,000	**		
Wiled:	(£39,981)	.,,,40,000			
Wool	\$177,202 (£36,245)	106,000	"		
Dunatara stan	(±36,245)				
Precious stones	\$166,990 (£34,156)	•••			
Defense	1				
Standing army	•	01.141			
personnel .		91,141			
Standing air force personne	I	2,319			
Military	\$275,034	•			
expenditures	(£56,256)				
Education					
Primary and high schools		2 0 9 5			
Students		8,985 1,081,31 <i>7</i>			
Universities .		4			

10,776

Includes Luxembourg.

Students .

†1944.

*1939.



Belgian children sent to Switzerland by the Belgian Red Cross in 1945 for a three-month period to recover from the effects of bombings and under-nourishment

German occupation. In 1944, thanks to the commercial advances made by her under lend-lease, Belgium found herself a creditor of the Allies. This allowed her to import without encroaching upon her gold reserves, and to set her productive forces in motion. In 1946, industrial production had already attained an all-round 65% of its prewar volume. Recovery would have been still more marked if coal production had not remained stationary (77,697 short tons a day), because of the grave shortage of man-power.

The prosperity of Belgium was to be decided on the world markets. In 1946, the kingdom's exports amounted to about 26% of their average volume for the years 1936–38. Imports, on the other hand, had reached 55% of their prewar figure. In order to reduce this dangerous disequilibrium, Belgium was counting much on the formation of an economic union between Holland, Belgium and Luxembourg, which was agreed to in principle on Sept. 5, 1944, in London, by the Belgian and Dutch governments respectively. Thus, it would seem that economic considerations must draw together the three states which formerly composed the "Seventeen Provinces" of Charles V. (See also BELGIAN COLONIAL EMPIRE.)

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Belgrade

Capital and largest city of Yugoslavia, Belgrade (Beograd) had a population of 238,775 by the census of 1931. In the early part of 1941, German-circulated leaflets accusing the Slavs of mistreating German minorities flooded Belgrade and other cities. After days of deliberation in the cabinet, Premier Dragisha Cvetkovitch signed a pact in Vienna on March 25 binding Yugoslavia to the

axis. So unpopular was this decision that the populace revolted two days later, forced the cabinet to resign, and overthrew the Regency of Prince Paul. The army under General Dushan Simovitch then proclaimed young Peter II king. The people were jubilant, but Germany was angered. On April 6, German planes attacked Belgrade and fired the city, which was soon occupied, and captured 12,000 troops. Shops were looted, inhabitants were killed and a wave of sabotage devastated the city. Four nazi administrators rose and fell, until Franz Neuhausen arrived as consul general to assume absolute control. Partisans fled to the hills and continued the fight despite their split into two camps. (See Yugoslavia.) Russian and Yugoslav troops recaptured Belgrade on October 20, 1944.

Benefactions

See Donations and Bequests.

Benes, Eduard

Beneš (1884-), Czechoslovakian statesman, was born May 28, 1884, in Kožlany, Czechoslovakia, of poor peasants. Educated at the faculty of philosophy at Prague university, the Sorbonne and the Ecole de Science Politique in Paris, he was graduated with a doctor of laws degree from the University of Dijon in 1908. During World War I, he worked closely with Thomas G. Masaryk in Paris and other Allied capitals in publicizing the cause of Czechoslovak nationalism. After the war, he became foreign minister in the newly-formed Czechoslovak government and was premier of one short-lived government, 1921-22. Head of his country's delegation to the Paris peace conference, he was a member of the League of Nations council in 1923 and 1925. He actively agitated in favour of safeguarding the interests of the small states in Europe. A confirmed democrat, Dr. Beneš was president of Czechoslovakia from Dec. 18, 1935 to Oct. 5, 1938, when he resigned that office after the Munich agreement.

Benes went to the United States, where he lectured at the University of Chicago. Shortly after the outbreak of World War II, he organized the Czechoslovak National committee in France. Throughout the war years, he continued to direct the Czech government in exile at London. In Moscow, on Dec. 12, 1943, he concluded a Czech-soviet mutual friendship treaty. Subsequently he stated that while opposed to the concept of a Pan-Slavic bloc, he felt that collaboration between Slavic peoples would work to the "advantage of all Europe." Benes returned to liberated Prague in May 1945, and thereafter endorsed a number of sweeping measures submitted by his cabinet. He approved forcible evacuation of the large majority of Sudeten Germans from Czechoslovakia and of Hungarians from Slovakia. He signed a decree (Oct. 24, 1945), nationalizing the country's commercial banks, insurance companies, coal mines, mineral deposits, steel plants, the Bata shoe factories and 27 large Czechoslovak industries. On June 19, 1946, the Czechoslovak parliament re-elected Dr. Benes as president to serve until a new constitution was drafted.

Bennett, Henry Gordon

Bennett (1887—), Australian army officer, was born April 15, 1887, in Balwyn, Victoria, Australia. After studying at Hawthorne college, Victoria, he became a public accountant. In World War I, he was decorated several times and rose to lieutenant colonel and brigade commander in the Australian army.

Promoted to a major general in 1931, Bennett was in

command of Australian forces in the disastrous Malayan campaign in World War II. While Gen. Arthur Percival, the British commander in chief, was negotiating the surrender of Singapore on Feb. 15, 1942, Bennett and a group of British imperial officers escaped from Singapore in a Chinese sampan and reached Batavia. At the time, the Australian war cabinet approved his conduct in the Malaya battles with a vote of confidence on March 2, 1942. Later, however, Bennett was criticized by Gen. Thomas A. Blamey.

Bennett subsequently retired from the army, May 1, 1944, declaring that he had been forced out by Blamey—a charge denied by the latter.

In 1945, Bennett walked out of a military inquiry into the circumstances of his escape but testified at a public inquiry headed by Justice George Ligertwood in late December of that year. On Jan. 4, 1946, Ligertwood reported that Bennett was not justified in relinquishing his command and leaving Singapore before the surrender terms were completed. The justice added, however, that Bennett in deciding to escape was not conscious of the fact that he was committing a breach of his legal or military duty. The report cleared Bennett from charges that he had acted from motives of personal safety, declaring that his escape was inspired by patriotism and the belief that he was acting in the best interests of his country.

Benton, William

Benton (1900—), U.S. government official, was born on April 1, 1900, in Minneapolis, Minn. He was graduated from Yale university in 1921, and spent 1922—36 in the advertising agency business, the last six of these years in partnership with Chester Bowles, who later became Office of Price Administration administrator and director of economic stabilization.

A major turning point in Benton's career came when in 1936 he resigned as board chairman of Benton and Bowles and, after a world trip, accepted a vice-presidency of the University of Chicago in 1937, on a six months per year basis. At the university his main interest was in developing new instruments of education, notably broadcasting, motion pictures and publications. At Benton's instance the university entered into an association with Encyclopædia Britannica, Inc., of which he became chairman of the board in 1943. Under Benton's leadership Britannica entered the field of classroom motion pictures through its subsidiary, Encyclopædia Britannica Films Inc.

During his "free" six-months periods, Benton participated in founding the Committee for Economic Development, of which he was vice-chairman of the board of trustees; assisted Nelson Rockefeller in the latter's work as co-ordinator of Inter-American affairs; and acquired ownership of several small companies in the fields of music publishing, broadcasting service, and "wired music," with the Muzak corporation as key company.

In Aug. 1945 Benton was appointed assistant secretary of state for public affairs, and was sworn in on Sept. 14. He gave up all of his outside interests which involved operating responsibilities, including the board chairmanship of Britannica and the vice-presidency of the University of Chicago (of which he remained a member of the board of trustees), in order to devote himself to his new duties. These duties included helping to bring to the U.S. public a closer understanding of problems and policies in the field of foreign affairs; responsibility for U.S. participation in the United Nations Educational, Scientific and Cultural organization; and the development of a program for projecting to foreign peoples "a full and fair

picture of American life and of the aims and policies of the United States Government." On Jan. 1, 1946, Benton presented a program for the latter task which called for the maintenance of staffs of public affairs officers attached to U.S. embassies and legations abroad; use of international broadcasting from the U.S. in 24 languages; use of documentary motion pictures for exhibition noncommercially abroad; a fast service to foreign editors and publicists on full texts of important statements and a documentary service on background material; maintenance of U.S. information libraries in some 70 key cities abroad; and a plan for the exchange of students and scholars with other countries. This program represented a new departure for the U.S. in its peacetime foreign relations. On July 1, 1946, the congress voted approximately \$25,000,000 to support the program during fiscal 1947.

Bentonite

The demand for bentonite in the United States increased so consistently that the output made a new record high in every year from 1933 to 1945, with the exception of 1938. The trend of production and use is shown in the accompanying table.

Production of Bentonite in the U.S. (Short tons)

	1937	1939	1941	1943	1945
Sales	194,768	219,720	354,028	480,202	573,998
Used in					
Oil refining	83,941	95,247	118,625	158,671	145,749
Drilling Mud	37,210	35,880	58,468	68.841	162,418
Foundries and Steelworks .	56,970	53.872	121.283	181.412	161,907
Other Uses	16.647	34.721	55,652	71.278	103.924

Production increased almost threefold between 1937 and 1945; distributed by major uses oil refining increased 74%, foundry work 184% and drilling mud 336%; "other uses" increased more than sixfold, scattered among a wide variety of minor applications, none of which took more than a few thousand tons. The expanding demand for bentonite in oil refining was largely at the expense of fuller's earth. (See also Fuller's Earth; Mica.)

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Bequests, Philanthropic

See Donations and Bequests.

Beria, Lavrenti Pavlovitch

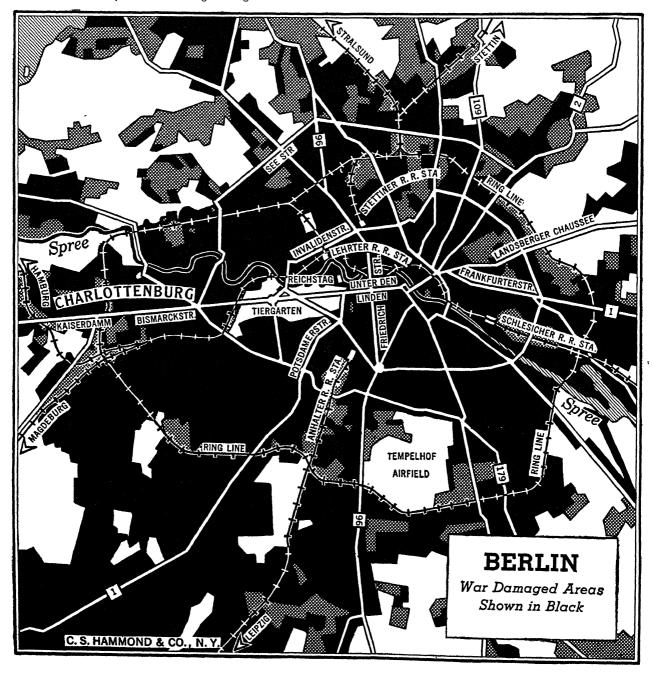
Beria (1899-), Russian government official, was born in Georgia in the Russian Caucasus. He joined the Communist party in Baku in 1917 and played an active role in the Russian Revolution. Beria subsequently rose to prominence in party ranks in his native Georgia and was chief of the public security organization in the Caucasus, 1921-31. He also was general secretary of the central committee of the Georgian section of the Communist party, 1931, and general secretary of the Transcaucasian Regional committee of the Communist party in 1932. During the great "purge" in 1938, he complained to Stalin that the O.G.P.U. had wrecked the party's administrative machinery in the Caucasus. Beria's complaint that the O.G.P.U. tactics had thoroughly demoralized the army and industry led Stalin to overhaul the dreaded secret police. On Aug. 12, 1938, he appointed Beria vice commissar of the commissariat of the interior (N.K.V.D.), in which the O.G.P.U. was incorporated. Beria became head of the N.K.V.D. on Dec. 8, 1938, and in this capacity halted mass expulsions from the party and restrained the

secret police. After the start of the German invasion, Stalin appointed Beria to membership July 1, 1941, on the newly-created State Committee of Defense. On July 20, the same year, the commissariats of internal affairs and national security, which had been separated, were merged again into the united N.K.V.D. and placed under Beria. As head of the commissariat for internal affairs, Beria administered what was virtually his own army and militia. His special job on the defense committee was organization of the armaments industry. Beria, who also became vice chairman of the Council of People's Commissars, was one of the alternate members of the politburo. He was appointed to the Committee for the Economic Rehabilitation of Liberated Areas in 1943. During World War II, he was elevated to the rank of marshal. On Jan. 14, 1946, it was announced that Beria had been replaced as head of the N.K.V.D. by Col. Gen. Sergei Kruglev.

Berlin

Capital of the German reich from 1871 to 1945, Berlin was the largest and most important city of Germany. Reorganized in 1920 to include several suburbs, greater Berlin had an area of 341 sq.mi.; pop. (census 1933) 4,236,416, (census 1939) 4,332,242, (est. 1946) 3,200,000.

Its favourable position in north Germany on the river Spree, between the Elbe and Oder rivers, afforded it cheap water transportation through Germany's wide-reaching system of rivers and canals. It was also the centre of Germany's network of railways, motor highways and commercial air lines. Politically important as the seat of the Prussian and German governments, it contained the great buildings of central administration as well as the principal banks, insurance company offices and other financial institutions. In the suburbs were numerous large industrial plants, the most important of which were metal, electrical and munitions works. All these factors made Berlin an



obvious target for Allied bombing in World War II, which wrought terrific havoc and destruction.

Hitler, with the aid of his architect and engineer, Albert Speer, inaugurated a grandiose construction program to transform the city. The Tempelhof airport was enlarged during the winter of 1937-38 to be the biggest in Europe, with a scheduled arrival and departure of 102 large planes every 24 hours. A great stadium and sport field was built in west Berlin for the Olympic games of 1936. A gigantic reichsbank, a 2,500-room aviation building for Hermann Goering's officials, a magnificent chancellery for Hitler himself, and many other imposing buildings were started or completed. At the laying of the cornerstone of the faculty of military science, the first building of the new Berlin university, Hitler declared on Nov. 27, 1937: "It is my unalterable determination to ornament Berlin with those streets, structures and public squares which will make it through all the ages the worthy capital of the German reich. The size of these projects will not be measured by the needs of 1937. They will be planned with the knowledge that it is our duty to prepare a city that will stand a thousand years, worthy of the immeasurable future of a nation with a thousand years' history." Vanity of vanities! Within eight years virtually all of them were a dismal mass of rubble and tangled steel.

Berlin was one of the most heavily bombed cities in the world during World War II. From the first Allied air assault on Aug. 25, 1940, until April 20, 1945, when the British royal air force finished with it, the city was blasted with 76,652 tons of explosives and incendiary bombs, 50,690 from bomber command planes, and 25,962 from the U.S. 8th air force. To lessen the danger from air attacks, the Germans camouflaged important landmarks like the east-west axis highway, west of the Brandenburg gate.

Thousands of children were sent for safety to other parts of Germany, and many official staffs were moved to small towns not far from Berlin.

Though many very heavy raids were made at various times during the war, the greatest destruction took place in the early weeks of 1945.

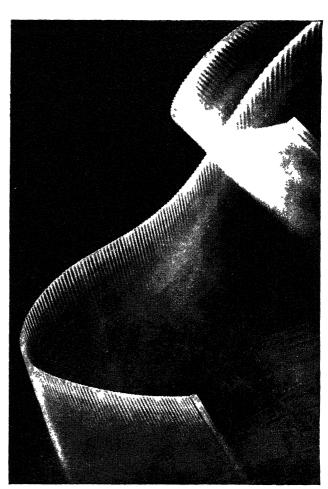
Most of the buildings in the heart of Berlin—the business and official districts along Unter den Linden, the Wilhelmstrasse and Leipzigerstrasse—and in several other areas were destroyed. It was estimated that 80% of the residential buildings were damaged and 20% rendered absolutely uninhabitable. Many families had to live crowded in cellars, half starved. Further frightful destruction was caused in the eight-day attack ending in capture of the city by the Russians early in May 1945. The Russians concentrated 40,000 tons of artillery shells on the city. During the first days after capturing Berlin, Russian soldiers freely robbed individuals, looted buildings, and raped women young and old in a most brutal orgy. Later, better discipline was established.

By the Yalta and Berlin agreements of Feb. and July 1945, Berlin was divided into four military areas: Russians in the east, U.S. in the south, British in the northwest and French in the north. The city was governed by a military board on which each of the four powers had a military representative. These men presided in rotation, but the efficiency of the board was greatly impaired by the difficulty of getting the four powers to agree on measures.

(S. B. F.)

Berlin Conference (1945)

See International Conferences, Allied (World War II); International Law.



Weird pattern of Berlin searchlights during an Allied raid over the German capital in 1943. Each track of light was made up of little waves caused by the vibration of the plane

Berlin-Rome-Tokyo Axis

See Fascism; Germany; Hungary; Italy, Japan; Union of Soviet Socialist Republics; World War II.

Bermuda

Bermuda is the largest of about 360 small islands approximately 580 mi. east by south of Cape Hatteras, N.C., and about 700 mi. from New York city. Area of the group (a British colony): 19.3 sq.mi.; pop. (1945 est) 35,-000. The census of March 26, 1939, gave a civil population of 30,814 (aside from semitransient tourists); the adjusted census population gave 31,481; an official estimate in 1941 was 32,451 (not including members of the armed services of the United Nations, U.S. army and navy base personnel, and imperial censorship employees); a 1942 estimate of the civil population was 32,857 and a 1944 estimate was 33,925. The capital is Hamilton, pop. (1945 est.) 3,500; population by the 1939 census was 1,863. The only other town of importance is St. George, pop. (1939) 2,665. Only about 16 of the islands are inhabited. Governors during the decade 1937-46: Sir R. J. T. Hilyard, until April 1939; Lt. Gen. Sir Denis K. Bernard, April 1939-Aug. 27, 1941; Viscount Knollys, Aug. 27, 1941-Aug. 24, 1943; Lt. Col. Lord Burghley, Aug. 24, 1943-Aug. 9, 1945; William Addis, Aug. 9, 1945-Jan. 23, 1946; Sir Ralph Leatham, after that date. Bermuda has a representative government including a legislative council of nine members (three officials and six nominated nonofficials) and a house of assembly of 36 members (four elected by each of the nine parishes). The

governor is assisted by an executive council of four official and three unofficial members.

* * *

BERMUDA's development during the decade 1937-46 hinged chiefly on its reorientation to wartime economic problems. This situation was especially serious inasmuch as the backbone of the colony's economy had been the tourist trade, and an average of 85% of government revenues had been derived from that trade. In 1937, 83,092 tourists visited Bermuda, the vast majority of them in British ships, although 90% were from the U.S. When a U.S. line in March 1938 tried to break into the trade by listing its ships as "hotels" while in port, the "ship-hotel" controversy began. A bill was introduced into the house of assembly in June of that year to prohibit use of ships as hotels, but it was temporarily abandoned on protests from the U.S. that it discriminated against U.S. shipping. A new law adopted in Aug. 1938 (effective Dec. 1) barred ship-hotels from Hamilton and St. George's harbours.

The outbreak of World War II in Sept. 1939 resulted in a serious decline in the tourist trade. It had been hoped that Bermuda, far removed from the original theatres of war activity, would attract many tourists who otherwise would have gone to Europe. That did not prove to be the case, chiefly because of fear of submarine attacks on shipping and the diversion of shipping to other purposes. Regular steamship communication between Bermuda and New York and European ports, normally maintained by British vessels, was seriously interfered with by the war. "Clipper" service by air between the U.S. and Europe was established early in 1939, with Bermuda as a port of call on the southern route, supplementing the already existing New York-Bermuda air service. Curtailment of plane services prevented use of that means of communication as a tourist substitute for steamers on any large scale, however. By 1942, the tourist trade had dropped to practically nothing; losses of ship-transported tourists were only partially offset by the increased transatlantic air travel which, in 1941, had brought a record 5,911 persons to Bermuda.

The changing nature of the war and especially the need of supplying the large military and naval personnel stationed in Bermuda brought about greatly increased shipping facilities in the early months of 1943. The large consignments of supplies transported to the islands resulted in occasional storage problems. The continued heavy transatlantic air travel, very largely for military purposes, brought about the creation in mid-1943 of an airport board to govern traffic and supervise airports and equipment. With progress of construction on U.S. naval bases, the government of that country adopted a ruling barring all tourists from islands in the western hemisphere where naval bases were under construction. With the end of the war, however, Bermudian officials began making plans for an early and large-scale revival of the tourist trade; it was anticipated that air-borne traffic, in view of

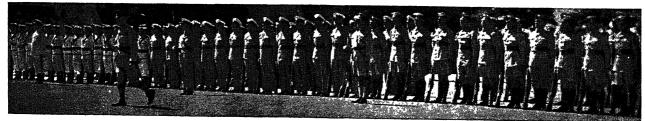
the wide expansion of such facilities for travel to Europe, would prove of especial importance.

The threat of war in 1939 which would involve the mother country resulted in increased war preparation throughout the year. A war service census was taken in March, gas defense drills were instituted and other steps were taken. When the war broke out in September, a state of national emergency was declared, by the terms of which the governor was empowered to rule by decree. Censorship of the mails was established, and conscription for defense purposes was put into effect. By the end of 1940 Bermuda had become a major centre of operations for prosecution of the war itself, as well as a potential base for the future defense of the western hemisphere. Its location in the western Atlantic made it a logical point of union for convoys bound from the U.S. and Canada to Great Britain; for similar reasons, Bermuda became an important station for examination, under the "navicert system," of neutral shipping bound to and from continental Europe. These varied wartime activities required a considerable enlargement of the naval and military establishments normally stationed at Bermuda from a March 1939 personnel of 1,098 to several times that figure. In addition, Bermuda became one of the leading sites for censorship of transatlantic mail; between 600 and 800 censors were located there to review mail to and from axis-controlled countries. Three of the leading hotels were commandeered to house this staff.

The executive agreement made by President F. D. Roosevelt and Prime Minister Winston Churchill in the summer of 1940 for the trade of 50 over-age destroyers in return for lease rights on various Atlantic naval and air base sites for 99 years involved Bermuda as one of the anticipated locations. The specific sites subsequently determined upon were on the east coast and on Great Bay. Initial contracts for construction work on these bases were let in the U.S. late in 1940. The U.S. in March 1941 formally took over 526 ac., a significant fraction of the colony's entire land area, for development of the bases. The main base was formally commissioned on July 1, 1941, as "Kindley field," and by the end of that year an estimated 4,500 U.S. marine and other forces were in Bermuda. Development of the bases was viewed with mixed reactions by the Bermudian population. It was realized that added prosperity would accrue to the colony, but the necessary eviction of families from the acquired areas aroused considerable local resentment, as did fears that sovereignty over the islands themselves might ultimately be transferred to the U.S. Such fears were vociferously aired in the house of assembly. The assembly also expressed its disapproval of the mother country's policy of appointing military men to serve as governors of the colony.

The anticipated prosperity materialized fully in 1942 and 1943 as the program of naval and air base construction got completely under way. The disadvantage of the

British sailors, marines and soldiers on the parade grounds of their barracks at Hamilton, Bermuda



situation was felt in the measure of inflation and the shortage of consumer goods which almost inevitably resulted. Construction activities tapered off rapidly in the latter part of 1943, as a consequence of which some departure of civilian labour was noted, although the scarcity of farm labour continued. Lord Burghley, governor in 1944, visited the U.S. in January of that year to discuss with Pres. Roosevelt and Secretary of State Cordell Hull various problems resulting from the program of naval base construction. These included problems of population pressure, food supply, imports of consumer goods, etc. A proposal was made on Feb. 18, 1944, for payment to Great Britain for the cost of the land used for U.S. naval bases but the assembly opposed a loan for this purpose because of doubt over the postwar status of the bases. Public opinion in the islands was aroused by a proposal made on Aug. 15, 1944, by Senator Kenneth McKellar of Tennessee that the U.S. should permanently acquire the various leased bases. Canada commissioned a naval training base in Bermuda on Aug. 1, 1944, and a British colonial office representative arrived four days later to discuss problems growing out of the bases.

The U.S. on Aug. 6, 1945, returned the small Ordnance Island to St. George municipal authorities, but U.S. naval officials a month later urged retention by the U.S. of its naval base in the islands. U.S. Representative Michael Bradley at the same time proposed British cession of the island base to the U.S. in part cancellation of lend-lease aid. Bermudian officials simultaneously proposed commercial use of Kindley airfield, operated by the U.S. army, but negotiations to that end encountered considerable delays. Canada had virtually closed its naval training base by Aug. 27, 1945, and formally announced its closing on Sept. 17.

The impact of the war brought the abandonment of one of Bermuda's most distinctive practices, the ban on use of automobiles. Gov. Hilyard resigned in April 1939 because of disagreement with the assembly over the latter's refusal to exempt him from the Bermudian law forbidding use of passenger motor cars. The house of assembly in 1941 provisionally lifted the ban as a wartime measure.

Automotive transportation was initially limited to government service, but a legislative act in 1942 permitted use of motor cars by doctors. Authorization was subsequently given the governor to permit the use of all types of cars on the highways and, in addition to the approximately 85 vehicles previously owned and operated by the insular and municipal governments, considerable numbers were imported for use in connection with naval base construction. The 38-year-old ban on private cars was finally and permanently lifted by action of the assembly on Aug. 2, 1946.

A minor controversy occurred between the U.S. and Great Britain in 1940 because of the allegedly excessive zeal displayed by British mail censors in Bermuda. This resulted in the temporary suspension of westbound stops at Hamilton by planes of Pan American Airways on its transatlantic line, although the controversy was later resolved and the plane stops resumed. The shipping shortage and the need of supplying naval and military personnel stationed in Bermuda resulted in 1942 in some food shortages and the beginning of a rationing program. Rationing and price control remained in effect in 1943 and 1944 and the latter was in part expanded. It was anticipated that the end of World War II would bring an early easing in the problem of supplying consumer goods, especially imported foods, and the first shipment of meat to reach Bermuda through commercial channels after 1942 arrived Sept. 3, 1945. With the end of the war, all shipping controls on cargoes from Canada and the U.S. were declared lifted on Aug. 30, 1945.

The colonial assembly in 1942 approved a long-range educational program involving an increase in the school-leaving age from 13 to 14 years, provision for manual training and a girls' domestic training system, agricultural education, and generally improved teaching standards and requirements. Other internal developments included the proposal, made by the government in 1943 in anticipation of the prospective completion of defense construction and its adverse effect on the financial structure, that an income

tax be adopted as part of the tax program to meet the expected decline in governmental revenues. The assembly rejected the proposal in June, however. In the same year the colony's first divorce law was enacted. The assembly also provided for a heavy increase in liquor taxes. As a wartime measure, the colonial government in 1943 provided an interestfree loan of £607,400 for aid to Great Britain. A war refugee conference, held in Bermuda early in May 1943, issued a brief report on May 9 which held in the main that the general problem of refugee aid should remain subordinated to the war effort; the conference was attended by both British and U.S. representatives.

	100	Bermuda:	1944			
Items	1938 Value (000's omitted)	Amount or Number	Value (000's omitted)			Amount or Number
Exchange rate	,,	£1 = \$4.889		£1 = $$3.83$		£4.035
Finance Government Revenues Government Expenditures National Debt	£460 (\$2,249) £452 (\$2,210) £75 (\$367)		£394 (\$1,509) £412 (\$1,577) £75 (\$287)		£801 (\$3,234) £748 (\$3,018) £875 (\$3,531)	
Communication Telephones Radio Sets		2,257				2,600 6,810
Crops Potatoes		2,220 tons				2,520 tons 1,100 tons
Livestock Poultry Cattle		50,000 1,800 1,500 900		60,000 1,700 1,400 900		70,000* 1,350* 1,000* 3,600*
Sea Products Fish		352 tons 15,000		1 <i>57</i> fons 6,000		•••
Exports Total	£49 (\$249) £11 (\$54) £5 (\$23) £3 (\$17)	54,436 crates 1,949 pkg.	£84 (\$320) £14 (\$53) £3 (\$12) £5 (\$19)	51,862 crates 1,420 cases 483 tons	£30 (\$120)	 3,961 cases
Imports Total	£1,907 (\$9,323) £149 (\$729) £95 (\$465) £83 (\$405) £73 (\$357)	10,673 pkg. 961 pkg.	£1,469 (\$5,628) £150 (\$574) £82 (\$313) £43 (\$165) £43 (\$164)	•••	£2,466 (\$9,949) £276 (\$1,113) £44 (\$176) £71 (\$285) £190 (\$765)	
Education Government-aided Schools Enrolment *1943, †1939.	‡1 941.	30† 4,670† (re	eliable data not av	29‡ 5,182‡ ailable).	(none).	



Admiral Sir Ralph Leatham, appointed governor of Bermuda on Jan. 23, 1946, being greeted on his arrival at Hamilton by Mayor H. St. George Butterfield (right)

Liberalization of the suffrage, a problem of perennial concern in Bermuda, brought the return for amendments by the legislative council to the house of assembly on May 2, 1944, of a bill to establish woman suffrage. The bill was passed in modified form on May 12. A new climax in the struggle to establish woman suffrage came in the defeat on Feb. 17, 1945, of a motion offered in the assembly by Dr. A. E. Cann, a Negro member, providing for universal suffrage. The woman suffrage society was subsequently dissolved April 11.

The U.S. and the British commonwealth participated in a telecommunications conference opening at Hamilton Sept. 22, 1945. On Nov. 29 the conference announced agreement on maximum rates for telecommunications facilities and on Dec. 4 the eight countries participating signed an executive pact cutting international communications rates, ending monopolies in other countries, and giving the U.S. the right to maintain direct connections with certain British dominions and possessions. A civil aviation conference at Hamilton agreed on Jan. 15, 1946, on the mutual commercial use of nine military airfields built by the U.S. in British possessions in the North Atlantic and the Caribbean.

Dissatisfaction with administrative handling of various domestic problems led Dr. E. F. Gordon, president of the Bermuda Workers' association, to announce on March 4, 1946, that he would petition for the appointment of a royal investigating commission.

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Berne

The city of Berne, Switzerland, (pop. 129,331), made capital of the Swiss confederation in 1848, is situated on a peninsula formed by the curving river Aar, commands wonderful views of the snowy Alps of the Bernese Oberland, and is a favourite resort for tourists. It is also famous for its five bridges over the Aar, its old arcades along the streets, its many museums and its university, whose students increased from about 1,500 in 1937 to 2,513 in 1944–45. The town library contains many valuable manuscripts and rare printed books. It is the seat of the national bank and is second only to Zurich as a Swiss

financial centre. It is as the capital of the Swiss republic, however, that Berne is most important. The federal parliament building, where the national legislature meets, contains also the offices of the federal executive and administrative bodies. As the Swiss government consented to take charge of the embassies and legations of many of the belligerent nations during World War II, this considerably increased the population and activity of the city and made up for the loss of the tourist trade caused by the war. Berne became a haven for many refugees from Germany and other warring countries. It became a meeting place and listening post for both belligerents and neutrals. Much of the Red Cross work in forwarding mail, packages and food to prisoners of war and civilian internees in Germany and elsewhere was carried out from Berne. It also remained the headquarters of many international associations, such as postal, telegraph, railway and copyright organizations.

Bernhard

Prince Bernhard of the Netherlands (1911—) was born June 29, 1911, in Jena, Germany, of the old German house of Lippe-Biesterfeld. He was christened Bernhard Leopold Friedrich Eberhard Julius Kurt Karl Gottfried Peter. He studied at Berlin university, graduating with the degree of doctor of law. After leaving the university, he joined the staff of the German chemical concern, I. G. Farbenindustrie, working in Paris, Berlin and Amsterdam.

Prince Bernhard, who became a naturalized citizen of the Netherlands in 1936, was married Jan. 7, 1937, to Crown Princess Juliana, only child of Queen Wilhelmina of the Netherlands. During the invasion of Holland in May 1940, the prince, who had sworn allegiance to the throne, fulfilled his pledge of loyalty to the Netherlands and fled with the royal family to England. A major general and rear admiral in the Netherlands fighting forces, he was appointed Sept. 3, 1944, by Gen. Eisenhower as commander of Dutch patriot forces. The prince promptly notified Dutch resistance elements to await his instructions before coming out in the open against the German occupation troops. After the collapse of the German armies in May 1945, Bernhard returned with the royal family to Holland. (See also Juliana.)

Beryllium

The salient figures in connection with production and consumption of ores of beryllium during 1937-45 were as follows, in short tons:

	World	U.S	U.S.	U.S.	Stor	cks
	Production	Production	Imports	Supply	Industry	Gov't
193 <i>7</i>	375	75	182	227	2	
1938	1,026	25	146	171	2	_
1939	676	95	459	554	2	_
1940	2,166	121	805	926	3	
1941	4,090	158	2,666	2,824	2,200	
1942	3,005	269	2,050	2,319	1,400	725
1943	5,101	356	4,840	5,196	1,036	2.513
1944	3,384	388	3,115	3,503	131	4,684
1945	854	39	1.201	1.240	90	4 497

Comparison of the above columns indicates that during the war years the United States absorbed 84% of the world output of beryllium ores, but actually used only 61%, the remaining 23% being left in stock at the close of the war. Of the U.S. domestic output, 77% came from South Dakota; imports came chiefly from Brazil, Argentina, India and Australia. The largest use of beryllium was in alloys with copper, and some pure metal was used as windows in X-ray tubes. The use of the oxide as a phosphor in the coating of fluorescent lights expanded

as this method of lighting grew in popularity. The oxide was also finding applications as a refractory.

It had been known since early in the 1930s that the bombardment of beryllium with alpha particles from radium liberated neutrons. This method of providing a neutron supply was used in some phases of the early work on the fission of uranium, during the course of the development of the atomic bomb, though other sources were used in the later production stages. Beryllium had also been used as a moderator, to slow down the speed of neutrons, but was abandoned in favour of graphite, which was cheaper and more readily adaptable. (G. A. Ro.)

Bessarabia

See Rumania; Union of Soviet Socialist Republics; World War II.

Best Sellers

See BOOK PUBLISHING.

Betatron

See CANCER; PHYSICS; RADIOLOGY.

Beveridge, Baron, of Tuggal

Lord Beveridge (William Henry Beveridge) (1879—), British economist and politician, was born in Rangpur, Bengal, March 5, 1879. He served in the government during World War I as economic adviser on several ministerial boards. After the war, he was director of the London School of Economics and Political Science (1919–37) and was a member of government committees on coal and rationing. He was named in 1940 as adviser on manpower and industrial capacity to the ministry of labour, and in June 1941 he was appointed chairman of the interdepartmental committee on social insurance and allied services with a view toward suggesting reform methods.

He submitted (Dec. 1, 1942) the celebrated "Beveridge Plan"—100,000-word document outlining a new social security system, which included recommendations for unemployment insurance, free medical and hospital treatment, child benefits, old-age pensions and marriage and death grants. (See Social Security.)

The Beveridge plan was termed "too radical" by some Conservative M.P.s; Labourites generally regarded it as a broad step toward socialization.

In Oct. 1944, he was elected to the house of commons on the Liberal party ticket, and on Feb. 7, 1945, he was named one of the Liberal party's vice-presidents.

He was defeated when he ran again during the national elections in the summer of 1945.

Beveridge was created a baron on June 12, 1946, and took the title Baron Beveridge of Tuggal.

Bevin, Ernest

Bevin (1881—), British labour leader and statesman, was born in Winsford, Somerset, England. Son of a farmhand, young Bevin was a truck driver in the Bristol area and became general secretary of the Transport and General Workers' union in 1922, holding that post until 1940. He played a leading part in the general strike of 1926 which was broken by Winston Churchill, who later offered Bevin a post in his cabinet. In 1937, he was appointed chairman of the General Council of Trades Union congress. An early opponent of axis aggression, Bevin frequently castigated Chamberlain's policy and in May 1940 he joined the Churchill wartime coalition government as minister of labour and national service; on Oct. 3, of the

same year, he was promoted to the war cabinet. Bevin was instrumental in speeding output of munitions and keeping labour difficulties at a minimum.

After the Labourite victory at the polls, Bevin was appointed foreign secretary (July 27, 1945), by Prime Minister Clement Attlee. He then superseded Anthony Eden at the Big Three's conference in Potsdam. Bevin was one of the major participants in the London council of foreign ministers in 1945 and ascribed its failure to Molotov's insistence that small powers be excluded from drafting the peace pacts. His views on atomic policy were expressed in his statement to commons of Nov. 7, 1945, that the U.S. and Britain should keep the "secret" of the atomic bomb for the time being. At the sessions of the United Nations security council in London (Jan.-Feb. 1946), Bevin defended use of British troops in Greece and Java, denied that they were "menacing peace," scored soviet activities in Iran and charged that the "real menace" to peace was "incessant propaganda from Moscow against the British Commonwealth." Bevin's heated exchanges with Andrei Vishinsky, the soviet delegate, highlighted the sessions. The British foreign secretary also attended the Big Four peace conference at Paris in the spring of 1946, and the subsequent Paris peace parleys, which ended Oct. 15. In the majority of cases, Bevin sided with his U.S. colleague, Secretary of State Byrnes, a policy which led an insurgent group of Labourites to demand his ouster on grounds that he was making common cause with "Wall Street imperialists." However, Bevin's foreign policy won a resounding 353 to o vote of confidence in the house of commons on Nov. 18, 1946; the rebellious faction within the Labour ranks abstained from voting.

BEW (Board of Economic Warfare)

See WAR AND DEFENSE AGENCIES.

Bible Society, American

See Societies and Associations.

Bicycling

See CYCLING.

Bidault, Georges

Bidault (1899—), French statesman, was born Oct. 5, 1899, in Moulins, France, of a middle-class family. Drafted into the French army in 1917, he served with occupation forces in the Ruhr in 1919 and returned to his studies after demobilization. Graduating from the Sorbonne with high honours, he taught history in secondary schools in Valenciennes and Paris. In 1932, Bidault founded the left wing Catholic newspaper, L'Aube, with himself as foreign editor and columnist. At the outbreak of World War II, he joined the army with the rank of sergeant. Taken prisoner, he was held in the reich until 1941. Upon his release, he joined the underground and in 1943, became president of the national council of resistance.

About two weeks after the liberation of Paris, Bidault was named foreign minister (Sept. 9, 1944), in Charles de Gaulle's provisional government. He headed the French delegation that attended the opening sessions of the United Nations in San Francisco in April 1945, attended the first council of foreign ministers in London in the fall of that year and the U.N. sessions in London in early 1946. At the Paris sessions of the council of foreign ministers and at the following 21 nations peace conference,

he generally aligned French foreign policy with the socalled "western bloc," although he was the most frequent dissenter among the Byrnes-Bevin-Bidault trio.

Following the elections of June 2, 1946, in which Bidault's party, the M.R.P. (Mouvement Républicain Populaire), emerged as the single strongest party in France, the constituent assembly elected Bidault as president of the provisional government. On June 24, he also formed a cabinet and thus became concurrently, president, premier and foreign minister of France. He was succeeded as premier by Léon Blum in Dec. 1946.

Biddle, Francis

Biddle (1886—), U.S. attorney and statesman, was born May 9, 1886, in Paris, France, and was taken to the U.S. in his infancy. He was graduated *cum laude* from Harvard university (1909) with a B.A. degree and started the practice of law in 1912 in Pennsylvania. In the Roosevelt administration, he was solicitor-general, 1940—41, and was appointed by Pres. Roosevelt to the post of attorney general in 1941. During World War II, Biddle championed civil liberties, frequently warning against mob hysteria in dealing with aliens whom he contended should be treated "without malice or race hatred." In June 1944, he defended the government's seizure of the Montgomery Ward plant in Chicago as a move in the public interest. He resigned May 23, 1945, and was replaced by Thomas C. Clark.

Some four months later (Sept. 12), Pres. Truman appointed Biddle as U.S. judge on the international tribunal that tried the German war criminals at Nuernberg. On Nov. 12, 1946, Pres. Truman announced that he had approved a recommendation made by Biddle that the United Nations establish a code of international criminal law. The president also disclosed that he had accepted Biddle's submitted resignation.

Bierut, Boleslaw

Bierut (1892—), Polish politician, was the son of a Lublin peasant. In his youth, he joined Polish revolutionaries who worked for independence from Russia and participated in the underground anti-tsarist activities. After finishing school, he became a compositor in a printing shop, joined the Socialist and later the Communist party, and spent much time in Moscow prior to 1945. Because of his left wing philosophy, he was persona non grata with the Polish government formed after World War I.

During the German occupation of World War II, Bierut was active in the Polish underground movements. He became president of the National Council of Poland in 1943 and president of the newly-created soviet-sponsored Lublin provisional government on Dec. 31, 1944. He retained the presidency of the new Polish government of national unity that was formed in late June 1945. In his first press conference, on Oct. 10, 1945, he declared that Poland desired to be completely independent of all outside powers. He also asserted that the security of Poland depended on establishment of friendly relations with the soviet union, but emphasized that this would not mean Polish adoption of the larger country's economic or political systems. On May 27, 1946, he secured an arrangement under which the U.S.S.R. agreed to supply Poland with arms and munitions under long-term credits.

In an article that appeared in all Polish newspapers on Nov. 23, 1946, Bierut said that attacks on the government from Catholic pulpits formed "one of the greatest barriers to the good relations between the church and state." He also demanded that Polish Catholic priests "stop using their sermons for political purposes."

Biggers, John David

Biggers (1888—), U.S. industrialist, was born Dec. 19, 1888, in St. Louis, Mo. He was educated at Washington university (St. Louis) and at the University of Michigan, where he received his A.B. degree in 1909. He became president of the Libby-Owens-Ford Glass Co., in Toledo, O., in 1930. Biggers, who directed the U.S. census of unemployment (1937–38), was named, in June 1940, to become deputy commissioner under William S. Knudsen on the U.S. Council of National Defense, specializing in industrial production for armaments.

On Jan. 7, 1941, Biggers was appointed executive director of the production division of the newly created Office of Production Management. He left the OPM in August of that year to become U.S. minister to London. Shortly after his arrival, he devoted himself to problems of production in connection with lend-lease. He returned to the U.S. in Oct. 1941, and was granted a leave of absence by President Franklin D. Roosevelt to resume his post with the Libby-Owens-Ford Co.

"Big Inch" Line

See Petroleum.

Bikini

See Atomic Bomb; Marshall Islands.

Billiards

In the world of billiards, the most eventful year of the decade 1937–46 was 1938. It was a year which, among other achievements, saw Roger Conti, veteran French expert, dethrone Welker Cochran of San Francisco as the three-cushion champion of the world. The competition, held at Paris, resulted in a tie; in the play-off Conti won two out of three games from Cochran.

It was the year, also, in which Jimmy Caras of Wilmington, Del., Andrew Ponzi of Philadelphia, Pa., and Willie Mosconi of Philadelphia finished in a three-cornered deadlock for the pocket billiards crown and Caras emerged victorious from the play-off. A month later Caras retained the title by defeating Ponzi in a challenge match.

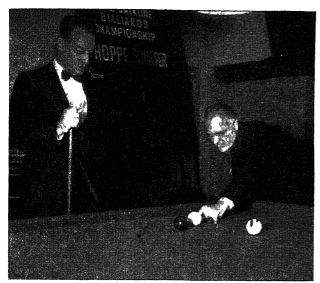
The same year saw young Jake Schaefer conquer Cochran for the 18.2 balk-line laurels. This pair dominated the balk-line field, and within thirty days Cochran regained the championship by turning back Schaefer in the challenge round.

Arthur Cranfield, Syracuse, N.Y., youngster, gained the national amateur diadem by beating Ted Murray of Burlington, Vt. Willie Hoppe, the biggest "name" in billiards, had no occasion to defend his three titles, the 18.1 and 71.2 balk-line championships and the cushion-carom honours.

But that was 1938. The year before, Hoppe kept the 18.1 laurels, achieving a new high-run record en route. Also in 1937, Ralph Greenleaf returned to activity after a four-year lay-off and proceeded to annex two tournaments in pocket billiards.

Hoppe and Schaefer introduced the 71.2 game, with Hoppe the victor. Schaefer, however, defeated Hoppe for the 28.2 crown. There were no three-cushion, 18.2 or cushion-carom tests.

The year 1939 brought a novel experiment in the form of an intercity series for the three-cushion championship. With ten cue artists, each representing an American city,



Willie Hoppe (right) and Jake Schaefer during the first 28.2 championship match in the U.S., Jan. 1937. Schaefer won the match

playing on a home-and-home basis, top honours finally went to Joe Chamaco of Sonora, Mex., who was playing for New York in this competition. With 55 victories and 17 defeats, Chamaco succeeded Conti, who did not defend.

In 1940, interest in three-cushion reached a new high, principally through the efforts of Hoppe. He shattered all standards as he romped to the most one-sided victory in history by capturing 20 games in a row in the grueling tests at Chicago, where 11 men vied for the three-cushion honours. Also in that year, Ponzi finished first with a 51-29 record in the six-man intercity struggle for the pocket billiards title.

Erwin Rudolph of Cleveland survived two play-offs and won the pockets championship in 1941, succeeding Mosconi. Hoppe retained the three-cushion crown that year. He remained on top the following year, but Rudolph lost the pockets title in a challenge match with Irving Crane of Livonia, N. Y. Before the year was up, however, Mosconi succeeded Crane.

In 1943 it was Hoppe who was best at three-cushions and Ponzi at pockets. The next year, Hoppe lost to Cochran and Mosconi regained the pockets championship. It was Mosconi and Cochran in 1945 and in 1946; Cochran, with no competition offered, kept the three-cushion title, while Crane annexed the pockets honours.

Throughout World War II, the stars of the billiard sport toured the U.S. service camps, playing exhibitions and entertaining the Allied fighters. Charley Peterson, trickshot expert, and Hoppe were the most prominent for their war work.

(L. Ef.)

Biochemistry

In the decade 1937–46, profound advances were made in classical biochemistry which includes the chemical nature and physiologic significance of proteins, carbohydrates, lipins, enzymes, hormones and vitamins; the processes of digestion, metabolism and nutrition; sources of energy in living systems; chemistry of blood and urine and their clinical significance; water balance, mineral and acid-base balance. More interest, however, was shown in the application of certain entirely new techniques and the development of several new points of view, which not only greatly enriched classical biochemistry and answered many of its difficult questions, but also led to entirely new fields of study, contributed significantly to the related fields of

genetics, pathology, pharmacology and immunology, as well as to clinical medicine, and thus greatly expanded and intensified knowledge of the mechanisms of living matter.

Among the new techniques may be mentioned the use of isotopes as tracers in the study of intermediary metabolism; microbiological methods (use of the growth of bacteria and neurospora in the quantitative estimation of vitamins, amino acids and other growth factors); the exploitation of electophoretic, ultracentrifugal and X-ray diffraction procedures in the characterization of proteins. Among the new points of view and fields of study were the demonstration that the infective agents of virus diseases are nonliving protein molecules; competitive inhibition in biological processes by structural analogues of biologically important substances; CO₂ fixation in animal tissues, formerly regarded as the prerogative of plants; lowand high-energy phosphate bonds and their role in the mobilization of metabolic energy; antibiotics, chemical inhibitors of bacterial growth like the sulfonamides and penicillin, their chemical nature and mode of action; cyclical processes in metabolism—that certain (probably most) metabolic reactions like the oxidation of pyruvic acid to CO₂ and water, the formation of lactic acid from glucose or glycogen, and the oxidation of most foods with the liberation of energy proceed by a progressive series of reactions, involving as many as ten or more interdependent

As in previous decades most of the facts of biochemistry were gathered by the classical methods of organic, analytical and physical chemistry. In the separation of pure compounds from complex mixtures, increasing use was made of selective adsorption and elution on the surface of inert solids, the so-called chromatography. In analytical and physicochemical studies, increasing use was made of optical methods, fluorimetry, and especially spectrophotometry in the identification and characterization of substances. X-ray diffraction studies were used not only for detection and identification of substances, but also for the measurement of interatomic distances, valence angles, the shape and size of molecules, especially proteins, and the stereochemical arrangement of groups especially in the steroids. By far the greatest amount of analytical data was, however, still gathered by rather conventional colorimetric, titrimetric and gasometric methods.

Proteins and Amino Acids.—Several new methods for the convenient and precise estimation of amino acids were developed; by use of these, knowledge of the amino acid composition of a number of pure proteins as well as of tissues, excreta and foods was greatly extended. At least three complex proteins, casein, insulin and edestin, had more than 95% of their nitrogen accounted for; and in the case of β -lacto-globulin the data were reported to be more than 99% complete, so that an empirical formula was written for a molecule of weight 42,000, containing 370 total amino acids of 20 different kinds. The amino acid data were in fair agreement with the physicochemical properties of the protein, molecular weight and acid-base combining capacity.

The reaction of amino acids with ninhydrin to form CO₂ and NH₃ was adapted by Donald Dexter Van Slyke and his associates for the quantitative estimation of total free amino acid, and increased the precision and significance of the estimation of total free amino acids in such mixtures as blood and protein hydrolysates. The reaction is not given by peptides or proteins. A single complication was that aspartic acid forms two moles of CO₂; all other

amino acids yield 1 mole of CO_2 quantitatively. For the estimation of individual amino acids, microbiological methods were increasingly used because of their convenience and reliability. By the end of the decade, 16 amino acids could be determined in this way. The use of periodic acid, which converts β -hydroxy- α -amino acids into NH₃ and aldehydes, furnished precise data for threonine, serine and hydroxy-lysine. Probably the most precise amino acid data (less than 1% error) would be obtained by the isotope dilution method, and by the use of specific decarboxylases. The former was very cumbersome, and involved the preliminary preparation of amino acids with an excess of N¹⁵. The specific decarboxylases were obtained from certain bacteria, and the method was successfully applied to five amino acids.

The groups responsible for the acid-base combining capacity of proteins and their corresponding pK' values were shown to be α -carboxyl, 3.0 to 3.2; other carboxyl, 3.0 to 47; imidazol, 5.6 to 7.0; α -amino, 7.6 to 8.4; sulfhydryl, 9.1 to 10.8; ϵ -amino (lysine), 9.4 to 10.6; phenolic hydroxyl, 9.8 to 10.4; guanidine (arginine), 11.6 to 12.6. Several proteins, for example haemoglobin and β -lactoglobulin, had their observed acid base titration curves satisfactorily interpreted in terms of the analytically determined values for these groups. In terms of the heat and of ionization of these groups, the effect of temperature on the titration curves was successfully predicted. In terms of the ionic charge on the molecule and the molecular weight, the electrophoretic mobility at any pH could be calculated, and in the case of the globular lactoglobulin, good agreement with the experimental values was found.

Criteria for the purity of crystalline proteins were critically examined. The property of constant solubility in the presence of increasing amounts of the solid protein was found to be most important, while electrophoretic velocities at various pH's and sedimentation in the ultracentrifuge were valuable adjuncts. Several crystalline proteins were shown to be mixtures. Among the proteins showing constant solubility, and therefore considered pure, were chymotrypsinagen, trypsin, pepsin, ribonuclease and several pituitary hormones.

The classical studies by Max Bergmann and associates on the hydrolysis of synthetic peptides by crystalline proteolytic enzymes, specifically characterized each of several enzymes in terms of the nature and position of the amino acids at the split peptide bonds. Thus the splitting of peptides by pepsin was found to occur only where tyrosine or phenyl-alanine are bound through their amino groups; chymotrypsin requires a peptide bond where tyrosine or phenyl alanine are bound through their carboxyl groups; while the action of trypsin is limited to linkages where lysine or argine are bound through their carboxyl groups. Other properties of the peptide, like the presence of extra acid or basic groups, may decrease but not extend the application of these rules. Thus the presence of a free amino group on the amino acid bound to tyrosine, interferes with the action of pepsin. For example, carbobenzoxy-glutanyl-tyrosine is split by pepsin, but glutamyltyrosine, with its free amino group in the glutamic acid, is not. If the basic group is located at a greater distance from the glutamyl-tyrosine peptide bond, pepsin is still capable of causing hydrolysis. In a similar manner the presence of a free carboxyl group on the amino acid adjacent to the tyrosyl linkage, interferes with the action of chymotrypsin. This specific characterization of these crystalline enzymes gave promise of value in studies on the

arrangement of amino acids in peptides and proteins.

Virus Proteins.—The observation by Wendell M. Stanley in 1935 that the infective agent of tobacco-mosaic virus could be identified with a crystalline protein led to much further work on the chemical nature of this and other virus proteins. In the case of several animal virus diseases, certain proteins separated from the infected animal tissues were shown to be the infective agents. Among these were vaccinia, chicken sarcoma, equine encephalomyelitis, rabbit papilloma, and later influenza and poliomyelitis. These nonliving infective molecules are reproduced only in the tissues of certain multicellular organisms, which favour the development of the infection. When the host is the free living individual bacterial cells, the infective protein is called bacteriophage.

All virus proteins were shown to be nucleoproteins, containing from 5% to 40% nucleic acid. They are all very large molecules, the plant viruses ranging in molecular weight from 5,000,000 to 60,000,000, and the animal viruses still larger. Only the ribose type of nucleic acid is found in the plant viruses, while certain animal viruses contain ribose (chicken sarcoma, equine encephalomyelitis) and others contain the desoxy-ribose types (rabbit papılloma, influenza). The animal virus proteins are more complex than the plant, and in addition to nucleic acid and protein contain lipoid, and at times flavin, copper and other components. Most of the crystalline plant virus proteins were characterized in terms of their amino acid composition.

As in the case of crystalline enzymes, the biologic activity (infectivity) of crystalline virus proteins was shown to be related to the presence of certain organic groups in the molecules. In some cases modification of these groups, like the acetylation of amino or phenolic hydroxyl groups, or the oxidation of —SH groups, or even the exposure of the protein to radiations, resulted in modified proteins, which, while still infective, were markedly attenuated. The chemical and physical attenuation of these infective agents were more convenient and better controlled than the classic biologic methods developed by Edward Jenner and Louis Pasteur of passing the infection through foreign hosts, and offered hope for the practical control of virus diseases.

Starch and Glycogen.—The chemical nature of these polysaccharides was elucidated by observations on the disaccharides formed by partial hydrolysis, by the nature of the methylated monosaccharides formed, by hydrolysis of the methylated polysaccharides, and by studies on the molecular weights of the polysaccharides. The conversion of starch and glycogen into maltose in large yield (about 50%) by action of amylases, and the formation of a large yield of 2,3,6-trimethyl glucose by methylation and hydrolysis, showed that these polysaccharides are composed primarily of anhydro-glucose units in which the aldehyde group of one glucose is linked to carbon 5 of the next. The yield of tetramethyl-glucose indicates the fraction of terminal glucose units; in the case of starch the formation of about 5% tetramethyl-glucose shows one out of 30 glucose units to be at the end of a chain, while with glycogen, about 10% tetramethyl-glucose, shows one-eleventh of the glucose units to be terminal.

In 1940, it was established that most natural starches contain two components, 10% to 30% amylose and 70% to 90% amylopectin. Amylose is completely converted to maltose by the enzyme β -amylase and after methylation and hydrolysis yields about 0.3% tetramethyl-glucose. This shows that only one in 300 or 400 glucose units is terminal. Amylopectin yields only 54% maltose, and after methylation and hydrolysis forms about 4.7% tetramethyl-glucose,

showing that one twenty-fifth of the glucose units are terminal. By osmotic pressure measurements, amylose has a molecular weight of 10,000 to 60,000, while the molecular weight of amylopectin is more variable and usually larger, 50,000 to 1,000,000. From this it was concluded that amylose molecules are single long straight chains of about 300 to 400 glucose units, while amylopectin consists of a large number of branched chains, each composed of about 25 glucose units, to form a ramified structure. The linkages between the glucose units in any one chain of the amylopectin molecule are 1-5 (that is, from the aldehyde group of one glucose unit to the secondary alcohol of carbon 5); but the linkage between the chains is from the terminal aldehyde of the chain to the primary alcohol carbon 6 of one of the glucose units in the next chain, the so called 1-6 linkage. Glycogen was found to yield only 47% maltose, when hydrolyzed by amylase and, after methylation and hydrolysis, to yield only 9% tetramethyl glucose. This indicated that one-eleventh of the glucose units are terminal. Glycogen is thus even more highly branched than amylopectin.

The blue colour which starch forms with iodine was shown to be determined by the number of glucose units in the free ends of the unbranched portion; that is, the number of glucose units between the terminal glucose unit with carbon 4 unsubstituted and the point where branching occurs, where carbon 6 is substituted in addition to carbon 4. In amylose, where there is no branching at all, this number is greatest, and the iodine colour is most deeply blue. With amylopectin, where the ends of the branches have a length of about 25 glucose units, the intensity of blue colour is only about one-sixth that of amylose, and the shade is more purple. The erythrodextrins, which give a red colour with iodine, have lengths of branches of about 10 glucose units. Glycogen, with the shortest end branches of only about five to eight glucose units, gives a brown colour with iodine.

Enzymatic Synthesis and Disaccharides and Polysaccharides.—The first synthesis of starch and glycogen was observed in 1939, when it was found that the phosphorylases, a widely distributed group of animal and plant enzymes which in 1935 had been shown by Carl F. Cori to convert glycogen and starch into glucose-6-phosphate, could also reverse this reaction. Either action requires the association of adenylic acid with the enzyme protein. The synthetic action requires also the presence of an activating polysaccharide, and the action is, therefore, not a condensation of glucose-6-phosphate units with each other, but rather their addition to a pre-existing polysaccharide chain. Comparative studies on the phosphorylases of different tissues showed many striking differences. The purified potato enzyme and the crystalline muscle phosphorylase form polysaccharides which are long straight chains of glucose units, give an intense blue colour with iodine, and thus resemble amylose; while the polysaccharides from the less pure enzymes of brain, heart and liver, are branched chains, giving a brown colour with iodine, and resemble amylopectin and glycogen. Later a branching factor was separated from both animal and plant tissues, the addition of which to the crystalline muscle enzyme, caused the synthesis of a glycogenlike branched polysaccharide. The potato phosphorylase can be activated by the straight chain amylose or more effectively by dextrins, and the maximum polysaccharide synthesis per unit weight of activating dextrin occurs when the chain length of the latter is five glucose units. The muscle enzyme requires as activator glycogen or amylopectin, that is, larger molecules with branches.

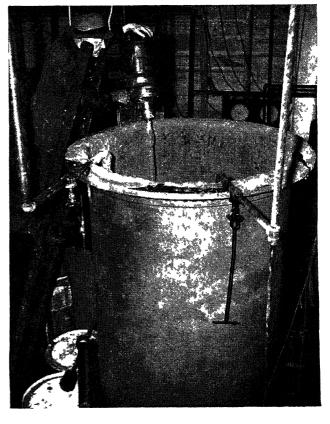
The first synthesis of sucrose was accomplished in 1943

by Michael Doudoroff with the aid of a bacterial phosphorylase from *Pseudomonas saccharophila*, which catalyses the reversible reaction glucose-1-phosphate+fructose=sucrose+inorganic phosphate. For this reaction, no added coenzyme seems to be necessary, and the synthesis does not require the addition of disaccharide. Disaccharides of glucose with sorbose, and of glucose with keto-xylose can be synthesized with the same enzyme. This work furnished convincing evidence that the furanose form of fructose exists in equilibrium with the predominating pyranose structure.

Vitamins.—During the decade, the synthesis of six vitamins was accomplished: vitamin A and vitamin E in 1937; pyridoxin in 1939; pantothenic acid and vitamin K in 1940; biotin in 1942. Although the chemical nature and structure of niacin was known in 1873, and it was incorrectly thought to be the antineuritic factor in 1912 to 1914, it was not until 1937 that it was recognized as the antiblacktongue factor for dogs, and the pellagra preventive factor for humans.

Great progress was made in the convenient and accurate estimation of vitamins in natural products by chemical, physical and microbiological methods. Except for vitamin D, these methods displaced entirely the animal assays involving use of rats, guinea pigs or chicks for practical vitamin analysis. Microbiological methods, first introduced for riboflavin by Esmond E. Snell and Frank M. Strong in 1939, were soon extended also to niacin, pantothenic acid, para-amino-benzoic acid and biotin. Ascorbic acid and vitamin A are best measured colorimetrically or spectro-

Vitamin A, extracted from livers of fish caught off Norway and Spain before World War II, was found to exist in its highest concentrate in shark-liver oil and was produced in large quantities in the U.S. beginning in 1942. The picture shows an agitator tank in which the crushed livers are mixed with water and chemicals, then heated and agitated to form a strong emulsion



photometrically. Thiamin is most commonly measured fluorometrically after oxidation to the fluorescent thiochrome.

A large body of data was obtained and much tabular information became available on the occurrence of vitamins in foods, and the effects of cooking, storage and processing. More difficult was the formulation of vitamin requirements of animals and man. The quantity of vitamin needed to prevent symptoms of a particular deficiency disease is not necessarily the optimum or even a desirable amount for good health. Aside from age and sex, vitamin requirements were shown to vary with the nature of the environment and of the nonvitamin constituents of the diet. Thus the requirement for thiamin is doubled, and that for choline is increased seven times by exposure to a hot moist (tropical) atmosphere. Also the thiamin requirement is much greater on a high carbohydrate diet than on a diet containing much fat and little carbohydrate. Despite these difficulties, the Committee on Foods and Nutrition of the National Research council of the United States in 1941 published a table of "Recommended Daily Allowances for Specific Nutrients." For the average 70 kg. man, this specified 3,000 calories, 70 g. protein, 0.8 g. calcium, 12 mg. iron, 5,000 units Vitamin A, 1.8 mg. thiamin, 75 mg. ascorbic acid, 2.7 mg. riboflavin, 18 mg. niacin; correspondingly small amounts are given for women and children, and larger amounts during pregnancy and lactation. This table was intended as a yardstick for good nutrition and was of great value in nutritional surveys.

The marked inadequacies in the average U.S. dietary which these surveys revealed, led in 1943 to legislation requiring the enrichment of flour so that each pound contained at least 2.0 mg. thiamin, 1.2 mg. riboflavin, 16 mg. of niacin, and 13 mg. of iron. For enriched bread, the minima were placed at 1.1 mg. thiamin, 0.7 mg. riboflavin, 10 mg. niacin and 8 mg. iron per pound. The bureau of agricultural economics of the U.S. department of agriculture showed that in 1944 for the first time the food which disappeared in the civilian consumption was equal to the N.R.C. recommended dietary allowances. These estimates involved conservative deductions for waste and deterioration of ingredients in storage, transportation, cooking and serving. In 1943 the values for riboflavin and niacin were deficient. In spite of this adequate supply, nutritional surveys among low income and industrial groups in the U.S. and Canada showed many dietaries far below the recommended allowances. Many of these cases were the result of poor food habits, ignorance or indifference, as well as unavailability of foods or inadequate income. Aside from the relatively few cases of acute and severe nutritional deficiency disease, there was considerable difference of opinion concerning the prevalence of deficiency states. The Food and Nutrition board of the N.R.C. reported that among the population of the U.S. mild deficiency states were common; because of their mildness and gradual development, they usually remained unsuspected. Many nutrition experts, on the other hand, felt that the prevalence of malnutrition was exaggerated, that the criteria for judging deficiency states were too sensitive, and that the recommended dietary allowances were too high. The evidence was very conflicting. Many cases of marked improvement of efficiency, decreased absenteeism, and improved well being were reported as a result of vitamin therapy. On the other hand, other surveys on native populations in special areas in widely different parts of the country showed that good health and

vigour were being maintained on diets containing far less than the recommended allowances. All studies seemed to agree that there was no value in supplementing normal rations of common foods with vitamins in excess of the recommended allowances. (See also Dietetics; Food Research.)

Vitamins as Coenzymes.—In the interpretation of the mechanisms by which vitamins exert their profound biological effects, their role as prosthetic groups of enzymes is most striking. Riboflavin was the first vitamin which was shown to be a coenzyme, when in 1933 the prosthetic group of the yellow enzyme (discovered by Otto Warburg and W. Christian in 1932) was recognized to be the same as lactoflavin, which in turn had vitamin B2 properties. The coenzyme nature of the vitamin was confirmed after the synthesis of riboflavin in 1935, by the demonstration in 1936 that the synthetic riboflavin-phosphate is identical with the coenzyme. In 1938, with the discovery of flavineadenine dinucleotide as the prosthetic group of d-amino acid oxidase, another coenzyme effect of a riboflavin compound was demonstrated. Later, cytochrome reductase was shown to contain riboflavin phosphate (mononucleotide), and at least seven other enzymes containing flavin-adeninedinucleotide were demonstrated. Among these were xanthine oxidase, glucose oxidase of yeast, diamine oxidase of kidney, diaphorase and glycine oxidase. These are all oxidizing enzymes, and it is the flavin part of the molecule which is reversibly oxidized and reduced.

In 1937, diphosphothiamin was shown to be identical with cocarboxylase, the prosthetic group of the enzyme which causes decarboxylation of pyruvic acid. Later, diphosphothiamin was shown to be necessary for a number of other enzymatic reactions of pyruvic acid, dismutation with the formation of lactic and acetic acids; oxidation, with the formation of acetic acid and CO₂; condensation with oxaloacetate to form cis-aconitate (citric acid cycle); and condensation with CO₂ to form oxaloacetate (CO₂ fixation). Since pyruvic acid is the pivotal intermediate of carbohydrate metabolism, the importance of thiamin for carbohydrate metabolism follows logically. The accumulation of pyruvate and lactate in the blood and tissues of B₁ deficient animals and the prompt decrease in their concentration following the administration of thiamin first demonstrated clearly the importance of thiamin for pyruvate metabolism.

The discovery of the pellagra-preventive character of niacin, in 1937, included this vitamin at once among those which determine enzyme activity, since nicotinamide two years earlier had been demonstrated to be a constituent of cozymase I and cozymase II. Cozymase I, later called diphosphopyridine nucleotide or DPN, was first known as a coenzyme for alcoholic fermentation; cozymase II, triphosphopyridine nucleotide or TPN, was shown by Warburg and Christian in 1933 to be necessary for the oxidation of glucose-6-phosphate by an enzyme in red blood cells. After 1937, these nicotinic-acid-containing nucleotides were shown to be involved in the enzymatic oxidation of numerous metabolites: glycerophosphate, alcohol, lactate, glutamate, malate, β -hydroxybutyrate; and there were doubtless many others. They thus play a fundamental role in intermediary metabolism.

A fourth vitamin, pyridoxine or B_6 , was shown to be a part of two kinds of enzyme systems, amino acid decarboxylases and transaminase. Here again it is not the originally described vitamin, but the phosphoric ester, in this case, of a derivative of the original vitamin, pyridoxal phosphate, which is the effective agent. Three substances show equal vitamin B_6 activity for growth of rats and

yeast: pyridoxine, pyridoxamine and pyridoxal, but only the last two play a role in animal metabolism. Pyridoxamine and pyridoxal constitute a considerable part (in active tissues like liver and yeast the greater part) of the vitamin B_6 content. Apparently animal tissues have the capacity of converting pyridoxin into pyridoxal and pyridoxamine.

In 1944 pyridoxal phosphate was shown to be a coenzyme for the decarboxylation of several amino acids by bacterial decarboxylases, and in 1945 a chemical function for pyridoxal phosphate was found in animal metabolism, that of a coenzyme for transaminases. This function was suggested by the observation that tissues of B₆-deficient rats have low transaminase activity and that pyridoxal and pyridoxamine are interconvertible by heating with amino and keto acids respectively. Proof of this function was furnished by preparation of the transaminase apoenzyme and the observation of its activation by synthetic pyridoxal phosphate. This gives the B₆ group of vitamins a fundamental role in protein metabolism. (See also Chemistry; Endocrinology; Genetics; Physiology; Psychology; Vitamins.)

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Biography

See American Literature; Children's Books; English Literature, etc.

Biological Survey, Bureau of

See WILDLIFE CONSERVATION.

Biological Warfare

Biological warfare may be defined as the use of bacteria, fungi, viruses, rickettsies and the toxic products of living organisms (as distinguished from synthetic chemical agents or poisons) to produce disease or death in men, animals or plants.

Through the end of the decade 1937-46 this means of waging war had never been used by any nation on a scale larger than isolated sabotage activities. During the years between World Wars I and II technical advances in bacteriology and allied fields stimulated the interests of both scientists and military personnel in the feasibility and possibility of biological warfare.

There was no unanimity of opinion that this form of warfare was technically possible. However, enough scientific evidence was accumulated to convince those responsible for planning the defense of the various United Nations that appropriate steps should be taken to prepare for adequate defense.

At the onset of World War II, agencies were set up in the English-speaking countries to carry on research and development and to advise policy-forming groups of the scientific advances in the pertinent fields of micro-biology. Prominent scientists of the United Kingdom, Canada and the United States were formed into a committee to exchange technical information on the subject. It was concluded that biological agents could be used as a means of waging war. Both military and civilian units were organized to carry out research projects which would enable the several nations to provide defensive measures against a possible biological warlare attack. It was assumed that an aggressor nation would not hesitate to use biological methods should such use seem advantageous to a nation at war.

All agents and their toxic products known to be pathogenic for men, animals or plants were subjected to comprehensive consideration and screening to ascertain those which could possibly be used by an enemy.

Specific agents deemed to be potentially useful to an enemy were selected for exhaustive study and investigation. They were cultivated in appropriate culture media under optimum growth conditions to develop strains of highest possible virulence. Their pathological effects on experimental animals and plants were studied. Methods of mass production were improved, as were means for storage and processing to maintain virulence. Animals and plants were infected with the various organisms so that methods of prevention, protection, diagnosis and treatment could be perfected. This led to a number of highly important advances in medical knowledge. Much light was thrown on the use of antibiotics such as penicillin and streptomycin. Knowledge of the use of sulfa drugs and other chemotherapeutic agents was advanced. Numerous research studies added to the basic information on principles of infection, immunity and epidemiology. Much was contributed to the general field of use and appreciation of antiseptics and germ-destroying chemicals and agents.

Comprehensive studies were conducted in the field of plant pathogens and growth-stimulating chemicals. Valuable information was gained in regard to infectious diseases of farm crops. Methods of control of various forms of leaf and stem blight, root rot, rusts and smuts were investigated. Chemicals acting as growth-stimulants and plant hormones were synthesized, and their effects were investigated.

Out of these war-stimulated researches evolved a mass of knowledge of much value to agriculture. Especially important to agricultural economics was the information gained on control of weed pests by use of chemical sprays.

The primary objective of the work of the United Nations was the development of defensive measures for use in the event of employment of biological warfare by an enemy. In this connection it was essential to consider critically many offensive agents in order to gain accurate information as to defensive procedures to be taken to protect against them.

Elaborate facilities were developed for obtaining and evaluating information about axis intentions. Reports indicated that some of the axis powers—Germany, Italy and Japan—had been carrying out research in biological warfare since before 1936. As information of such activities accumulated, it became increasingly evident that due consideration should be given to ways and means for use of this type of warfare against such nations as might attack one of the United Nations with biological agents.

The decade 1937-46—particularly the years 1940-46—witnessed an example of a co-operative enterprise in scientific research and development of a scope rarely, if ever, attempted before.

The military, naval, nonmilitary governmental agencies and civilian scientific groups of the United Kingdom, Canada and the United States, collaborated in various phases of basic research, developmental projects, production of matériel and testing projects. There was no single phase of the over-all problem of study of biological warfare in which this co-operative action was not evident. Certain materials designed by British scientists were produced in pilot plants in the United States and tested in Canada. An outstanding example of a jointly developed material was Rinderpest (serious infectious disease of cattle) vaccine. Since Rinderpest had never been present in North America, cattle on that continent would be highly susceptible. Should the disease have been introduced by an enemy, or accidentally, an important source of meat and dairy products would have been jeopardized seriously. A joint Canadian-United States commission was organized to study the disease and to prepare a vaccine to be used as a preventative. The efforts of the commission, composed of military and civilian scientists, met with marked success. An effective vaccine was developed and produced. It was tested in co-operation with British scientists in an area in Africa where the disease was prevalent. The actual field tests proved the vaccine to be markedly efficient. When the need for its use in North America as a war measure had passed, large quantities were made available to U.N.R.R.A. for use in China.

Even though extensive studies in biological warfare were carried out by the various United Nations and the axis powers, this type of warfare was not used by any of the belligerent nations in a primary military operation during World War II. Certainly some of the axis nations were engaged in active research to develop the potentialities of this means of warfare even before the decade 1937-46. Why they did not resort to active military use of biological agents remained a matter of conjecture. It would seem a safe assumption that their decision to avoid its use was based on strategic and tactical factors rather than upon a sense of moral values. Perhaps when the strategic situation might have been advantageous to the axis powers they foresaw that the air superiority of the United Nations was imminent, and so decided against this type of warfare on tactical grounds. They might have based their decisions not to use either biological or chemical agents as a final gesture upon fear of the added antipathy of the United Nations such a step would stimulate. Or again they may have been deterred by a fear of retaliation. As for the accounting for the fact that none of the United Nations used either chemical or biological agents, it was generally assumed that the policy-formers agreed among themselves not to engage in such tactics except as a retaliatory measure. Be that as it may, the value of large-scale use of biological warfare had neither been established nor disproved by actual military experience. Research and experiment led merely to the conclusion that it had advantages as a weapon.

The United Nations gained military information leading to means of adequate defense against a potential danger. Over and above this result, findings of lasting importance to the economy of the nations were forthcoming. Co-operative research was carried out on a scale never before attempted in the several fields of biology. Restrictions of military security prohibited statements concerning the specific biological agents studied, but technical information of a nonmilitary bearing, of value to medicine, agriculture, industry, the arts and basic sciences was made

available to the public. Scientific papers were published in the various technical, scientific and industrial journals to enable interested individuals and groups to make use of the various research studies.

Some of these contributions by the United Nations' biological research were as follows: studies of mechanism and development of immunity in humans and animals; advances in treatment of several infectious diseases; increased knowledge of use, and effect of antibiotics (pencillin and streptomycin) and sulfa drugs; development of methods of production and use of certain toxoids and vaccines; production and isolation of pure bacterial toxins and their use in preparation of toxoids; development and study of methods for rapid detection of minute quantities of disease-producing agents; improvement of methods for mass production of micro-organisms and their products; information as to production and control of plant diseases; study of the effects of 1,000 or more chemical agents on growing plants; development of protective devices, and techniques for safe handling of pathogenic micro-organisms and their toxic products. (See also CHEMICAL WAR-(A. H. WA.)

Biology

See BOTANY; ENTOMOLOGY; GENETICS; MARINE BIOLOGY; PHYSIOLOGY; ZOOLOGY.

Biotin

See CHEMISTRY.

Bird Refuges

See WILDLIFE CONSERVATION.

Birmingham

City, county and parliamentary borough, England, in the north-west of Warwickshire, Birmingham is a great industrial centre. Pop. (1938 est., 1,041,000); (1945 est.) 1,001,600. The year 1937 saw in Birmingham the climax of a great rebuilding effort which had begun in 1919, achieving 80,000 modern houses and the elimination of acres of slums. Compared with the rest of England, unemployment had been slight and industry was healthy. In 1938 the city celebrated the centenary of its charter with brilliant pageantry. In that year preparations against possible air attack slowed up rebuilding; atomic energy research at the university had already reached an advanced stage. Yet a great new hospital and medical school was opened, and in 1939 the city's Elmdon airport came into use. On the outbreak of World War II in Sept. 1939, all civil building ceased, except on part of the new civic centre and on the new King Edward VI school. Women and children were evacuated in anticipation of bombing raids, which began in Aug. 1940 and were almost incessant by night until April 1941. In these 2,241 people were killed; 6,692 injured; 160,000 houses and other buildings were destroyed or damaged. Birmingham gave its quota of men and women to the forces; those left in the factories of Birmingham and district achieved one-quarter of the nation's war production. During the war the future rebuilding of the centre and much of the suburbs of Birmingham was planned. Parliament approved in 1946 a £15,000,000 scheme for a new inner ring road requiring reconstruction of much of central Birmingham. Duddeston and Nechells, a slum area, was to be razed and rebuilt with homes and factories segregated, at a cost of £8,000,000. Other areas were to be similarly treated later. For 1947-56 100,000 new houses were planned. The world-famous jewellery quarter was to be rehoused in new "flatted" fac-

tories. Utility services, including water which was piped $73\frac{1}{2}$ mi. from Wales, were to be improved at a cost of £11,000,000, and social services were to be kept abreast of modern conditions. (A. S. Gs.)

Birth Control

At the beginning of the decade 1937-46, a colourful chapter in the history of birth control had reached its climax and another was beginning. In 1936, in a farreaching decision, the federal courts had lifted a ban which for 63 years had prevented physicians from freely exchanging information and materials for the control of human fertility. The decade following this decision was to mark attainment of maturity for the birth-control movement, following its early history of perennial court battles, clinic raids and public controversy.

The term "planned parenthood" came into being as the description of a program which included not only birth control but also aid to childless couples and education for marriage. The use of birth control for healthful spacing of births won inclusion in maternal-care programs of seven states.

Following clarification of the legal status of birth control in 1936, the inclusion of fertility control in public-health programs throughout the country became a major objective of the birth-control movement. For the better accomplishment of this purpose, two organizations, the American Birth Control league and the Birth Control Clinical Research bureau, were merged into one organization in 1938. One result of this merger was to eliminate duplication of effort and to permit presentation to the public of a comprehensive and practical program of education and action under the leadership of one strong national organizationthe Birth Control Federation of America. A few years after the merger, in order to emphasize the positive character of the organization, the name of the national organization was changed to the Planned Parenthood Federation of America, Inc.

The Planned Parenthood federation became the national agency and clearing house for the 35 state leagues and more than 200 local committees which were affiliated with the national organization in 1946. The local committees carried the burden of operating privately supported clinics for parents unable to afford the services of private physicians. Between 1938, the time of the merger, and 1946, the number of planned parenthood centres (including private, public health and hospital clinics) had grown from 489 to nearly 600.

While the clinics still performed a necessary and expanding service, parents in 1946 found it possible also to obtain advice and help in planning their families through the services of physicians in private practice.

Public opinion polls during the decade demonstrated the development in public acceptance of birth control as a health and social measure. In 1938 the Ladies Home Journal found in a survey that 79% of U.S. women favoured birth control. A Fortune magazine poll in 1938 estimated that sales of contraceptives then totalled close to \$250,000,000. A nation-wide Gallup poll in 1940 among both men and women revealed that 27% of those questioned favoured furnishing birth-control information through government health centres. In 1943, 84.9% of women, answering a second Fortune poll, declared themselves in favour of making knowledge of birth control available to all married women.

Even in Massachusetts and Connecticut, the only two states still forbidding physicians from giving birth-control information for any cause whatever, opinion polls showed the views of the public in sharp contradiction.

A significant milestone was passed in 1937, when the American Medical association adopted a report of its "Committee to Study Contraceptive Practices and Allied Problems," thus accepting birth-control as an integral part of medical practice. From then on, advance along the road to medical recognition came quickly. The following year, 332 physicians of the National Medical council, including the president, presented a signed document at a conference held by the children's bureau in Washington, D.C., asking that contraceptive information be included in all obstetrical, maternal and post-natal clinics as a means of reducing infant and maternal mortality.

Shortly thereafter, the Journal of the American Medical Association for the first time published a series of articles giving approved standards of contraceptive techniques and a list of reliable products. Similarly, the first scientific treatment of the subject of conception and birth control appeared in the Cyclopedia of Medicine and Surgery.

Discussion of various phases of conception control appeared in medical journals with increasing frequency. A study made by the Medical Committee of the Planned Parenthood federation showed that of the 3,381 physicians, obstetricians and gynaecologists answering a questionnaire, 96% declared their approval of conception control when medically indicated; that 88% approved of it for spacing births; and 77% believed it should be furnished to any married woman on request.

With the rapid growth of medical acceptance of birth control as a health measure, and the growing interest of the public in family planning, steps were taken to provide educational facilities for doctors in the techniques of conception control. Exhibits, films and technical manuals were supplied for medical meetings. Textbooks and pamphlets had nation-wide circulation among physicians and medical students. The Techniques of Conception Control, first published in 1933, went through a half-dozen editions.

Testimony as to the advantage of spacing children was the study of 7,000,000 births and stillbirths made by Dr. Jacob Yerushalmy. This study indicated that mothers could lower the chance of stillbirth if their babies were born neither too close nor too far apart. His findings supported the long-standing contention of medical authorities that child-spacing is a maternal health measure.

Legal Acceptance.—Legal obstruction was all but swept away during the decade. The U.S. circuit court in 1936 decided that contraceptives imported for legal purposes did not come within the restrictions of the federal statutes as these were articles employed by physicians "for the purpose of saving life or promoting the well-being of their patients." Similar decisions thereafter were won in the Canadian courts. In Puerto Rico, the U.S. district judge ruled in favour of a defendant, declaring that "contraceptive articles may have a lawful use."

The U.S. treasury declared the American Birth Control league a philanthropy and therefore tax free, with gifts and bequests deductible from tax returns. Furthermore, co-operation with the Federal Trade commission resulted in halting advertisements of fraudulent and dangerous drugs.

By a decision of the U.S. court of appeals, the Consumers' union won the right to recommend approved contraceptives to married women. A similar decision was won after the pamphlet, "Preparing for Marriage," by Paul Popenoe had been barred from the mails. Neither case,

said the court, came under the Comstock obscenity law as charged by the post office authorities.

There were, however, two adverse decisions in state courts. In Massachusetts the supreme court ruled that the state's proscriptive law on birth control was constitutional and with no exceptions for physicians. In 1944, a referendum to repeal the law lost by a close vote. In Connecticut, the state supreme court of errors likewise upheld a statute making it illegal for physicians to prescribe contraceptives or for individuals to use them. This ruling was appealed to the U.S. supreme court which, on the basis of a technicality, declined to review the decision of the lower courts.

Religious Attitudes.—During the late 1930s many of the leading Protestant and Jewish denominations took positive positions favourable to birth control. In 1944, a National Clergymen's Advisory council of more than 1,000 leaders was organized, and Planned Parenthood leagues in 15 states formed state advisory councils to co-operate with the national organization.

The most consistent opposition to birth-control methods continued to come from the Roman Catholic church. However, in 1937, the church gave its approbation to *The Rhythm*, a widely distributed book by Dr. Leo J. Latz, offering a "natural" method of birth control.

Minority Groups.—During the 1937–46 decade, the greatest need for birth-control information appeared to come from the less privileged minority groups. This was particularly true of the Negro population, inasmuch as twice as many Negro mothers as white were dying in child-birth; the same was true of Negro babies. In 1939, a dual program of birth-control service and education was initiated; demonstration areas in the south were established, and a National Negro Advisory council was organized. Effort was made to reach even the most limited in opportunity.

In 1944, a biracial committee on work with Negroes was appointed, a full-time Negro worker was added to the National Planned Parenthood staff and later a full-time field consultant. Conferences, meetings and institutes were part of an extensive educational program. Strong support came from the National Medical association, the National Council of Negro Women, the Negro Newspaper association, Jeanes teachers, public health educators, the Y.M.C.A. and Y.W.C.A. staffs, the National Urban league and the National Congress of Colored Parents and Teachers. In 24 Negro colleges and professional schools, interpretative programs were given; clinics in congested Negro districts were opened and Negro doctors were added to the list of Planned Parenthood referral physicians.

The condition of the migrant labourer, particularly in the years before World War II and during the depression, brought poignantly to the attention of the U.S. people the plight of the migrant workers. With the co-operation of official agencies and camp public health nurses, birth-control service was brought to many migrant camps and remote rural communities. In one year, 1938, more than 20,000 women were reached through this special effort.

Infertility Programs.—During the decade, planned parenthood organizations accepted aid to childless couples as a basic element of their program. Inasmuch as one married couple out of ten was involuntarily sterile, the demand for medical fertility specialists in this field increased yearly. More than 23,000 copies of the Planned Parenthood federation's pamphlet, "To Those Denied a Child," were circulated in the first year following publication.

Unfortunately, extension of both infertility research and services were severely hampered during the war years. In 1946, there were only 47 established clinics where childless couples could obtain treatment. The number of private specialists was also limited. Most of the existing infertility services were located in medical schools and hospitals, and a few in regular planned parenthood centres. Indicative of planned parenthood interest, was a grant of \$2,500 by the Connecticut league in 1946 for infertility research at Yale university, New Haven, Conn.

Clinic Services.—One ultimate goal of the planned parenthood movement was reached during the decade 1937–46 in seven states. In 1937, North Carolina became the first state to make child spacing an integral part of its program for maternal care. South Carolina followed in 1938. Five other states later included planned parenthood in their state health programs: Alabama, Florida, Texas, Mississippi and Virginia.

In 1941 the transition from the private clinic to state or county departments of health was facilitated by the U.S public health service when it declared that should a state department of health decide on its own initiative to under take a child-spacing program, the federal public health service would give the program, and would give the proposal the same consideration given to any other state health measure. Still another important ruling was issued by the commissioner of health of New York city in 1944 whereby "upon request directional information may be given to any person asking for the location of a child-spacing service."

Throughout the decade 568 Planned Parenthood clinics continued to serve thousands of patients in hospitals, public health centres and in their extramural services. World War II interfered severely with clinical service, owing to shortages of professional personnel and the difficulty in getting medical equipment, yet the clinics carried on. *

The referral service of the Planned Parenthood federation listed approximately 3,000 physicians to whom enquiries could be directed. In addition to these enquiries were other thousands of enquiries from physicians, social workers, nurses, educators, ministers, professional workers desiring technical or specialized information.

An ever broadening stream of technical literature poured steadily to state and local groups. In the later years of the decade, the literature was directed mainly toward specialized groups rather than to the public or the profession at large. (See also BIRTH STATISTICS.) (M. SR.)

Birth Statistics

Systematic records of births are kept principally by the English-speaking countries and the countries of western Europe. In order to facilitate comparisons of birth statistics, it is customary to divide the annual births of a country by its population for the same year; the result, usually expressed in terms of births per 1,000 of population, is known as the birth rate. Thus, in 1944 there were recorded 2,794,800 births in the United States with a mid-year population (including the armed forces overseas), estimated at 138,083,000, the birth rate was 20.2 per 1,000 of population.

International Comparisons and the Effect of War.—Table I contains a comparison of birth rates for the period from 1937 to 1944, for a number of countries, as far as the data were available. Generally speaking, the birth rates for the English-speaking countries and the countries of western Europe were at a relatively low level throughout this period as compared with the high rates in southern and eastern Europe, in South America and in Asia.

Table 1.—Annual Birth Rates per 1,000 Total Population in Certain Countries for Each Year from 1937 to 1944

in Certain Countries for Eden Fedr from 1937 to 1944									
Country	1937	Birth 1938	Rate p 1939	er 1,00 1940	0 Total 1941	Popula 1942	tion in 1943	1944	
North America United States Canada Mexico	17.1 19.8 40.0	17.6 20.5 38.7	17.3 20.3 45.0	17.9 21.4 43.5	18.9 22.2 43.5	20.9 23.4 45.5	21.5 24.0 43.6	20.2 23.8 42.9	
South America Argentina Chile Colombia Uruguay Venezuela	24 0 33 5 30 6 19 9 33.9	24.1 33.4 32.1 19.8 34.4	24.0 33.4 31.6 20.1 36.9	24.1 33.4 32.4 19 9 37.2	23 9 32.6 33.2 20 4 35.3	23 1 33.2 33 7 19.4 35.7	24.4 33.1 32.9 36.3	25.8 33.2 * 35.9	
Europe Austria Belgium Bulgaria Czechoslovakia Denmark Eire England and Wales Finland France Germany Greece Hungary Ireland, Northern Italy Netherlands Norway Poland Portugal Rumania Scotland Spain Sweden Switzerland Yuaoslavia	12.9 15.3 24.3 17.2 18.0 19.2 14.9 20.4 7 18.8 26.4 20.2 19.8 15.1 24.9 30.8 17.3 14.4 15.0 27.9	14.0 15.6 22.8 16.8 19.4 15.0 14.6 19.7 25.0 120.0 23.6 15.5 24.5 29.6 17.3 14.9 15.7	20.9 15.3 21.4 14.7 17.9 19.1 14.9 20.3 23.5 20.5 20.5 20.5 20.5 28.3 17.4 15.3 15.3 15.5 25.9	21.8 13.4 22.2 16.7† 18.3 19.1 14.6 17.9 19.6 23.4 20.8 16.3 ** 26.5 17.1 215.0 15.2	* 12.1 21.3 17.3† 18.5 19.0 14.0 13.0 18.6 18.8 20.9 20.3 15.9 27.7 17.5 15.6 15.6 16.9	* 13.1 21.9 18.3† 22.3 15.65 14.5 14.8 22.8 221.0 17.6 23.8 24.4 17.6 217.7 18.4	* 14.8 21.2 20.8 21.8 16.3 21.5 16.0 * 24.5 23.0 18.9 24.8 23.4 18.4 19.3 19.2	* 15.2 21.3 21.8 6 22.0 17.5 21.1 16.3 * * * * * * * * * * * * * * * * * * *	
Asia Ceylon, British India, British Japan Palestine	37.8 34.5 30.6 41.6	35.8 34.1 26.7 39.9	36.0 33.0 26.3 38.0	35.8 32.3 28.9 38.7	36.5 32.0 29.9 38.5	36.4 30.0 *	40.5 * 43.4	* * * 44.5	
Other Countires Australia	17.4 43.5	17.5 43.4	17.7 42.2	18.0 41.6	18.9 40.8	19.1 38.1	20.7 *	21.0	
New Zealand (Europeans) Union of South Africa (Whites)	17.3 24.9	17.9 25.0	18.7 25.3	21.2 25.3	22.8 24.9	21.7 25.2	19.7 26.2	21.6 *	
*Not available. †Bohemia-Moravia only									

There were varying patterns in the course of the birth rates after 1937. In the case of Germany, the birth rate began to rise shortly after the National Socialists came into power; by 1937 the rate was 18.8 per 1,000 with a rise continuing to a peak of 20.3 in 1939. This prewar rise was attributed by D. Kirk (Milbank Memorial Fund Quarterly, vol. xx, April 1942) to improvement in employment conditions, rather than to the intense propaganda conducted for more and larger families. Despite Germany's efforts to maintain her birth rate in the early years of World War II, the figure fell to a low point of 14.9 per 1,000 in 1942. Italy, which had a policy in effect after 1927 to stimulate her birth rate, had a birth rate of 22.9 per 1,000 in 1937, while her war with Ethiopia was in progress, compared with a level of 23.8 in the years of peace from 1931 to 1935. In 1938, after the end of this war, the rate rose to 23.6, a level which was maintained through 1940. The effect of World War II, however, was to reduce Italy's birth rate sharply, to a figure of 20.5 per 1,000 in 1943, the last year of record during the war. Japan, the remaining axis partner, had a birth rate of 30.6 per 1,000 in 1937; this fell sharply to 26.7 in 1938, the year after Japan became involved in large-scale hostilities with China. The rate rose subsequently to 29.9 in 1941, her last year of peace with the U.S.; later data were not available. Japan, like her axis partners, undertook measures to stimulate her population growth. These measures, announced by the cabinet on Jan. 22, 1941, had among their objectives the avowed purpose of supplying military and industrial manpower for the country, and also producing enough population to distribute throughout Asia to maintain a wai-won leadership.

While World War II adversely affected the birth rates of Germany and Italy, the English-speaking countries experienced increases. For example, in the U.S., the rate rose from 17.3 per 1,000 in 1939 to a peak of 21.5 in 1943, but then fell to 19.8 in 1945. The wartime movement may be attributed to several factors. First, the prosperity of the war years, even before the U.S. entered the conflict, gave many couples the opportunity to have children they could not afford in the preceding years of depression. Secondly, there were undoubtedly instances in which births were planned in order to have a basis for exemption from military obligation. On the other hand, there was the natural consequence of the many marriages undertaken in anticipation of military service. The withdrawal of many millions of men for service abroad beginning in 1943 had its adverse effect on the birth rate in 1944 and 1945.

The record for Canada was similar to that of the U.S., but the birth rates lay at a high level; the rate rose from 20.3 per 1,000 in 1939 to 24.0 in 1943.

The first effect of World War II upon the birth rate of England and Wales was a reduction from 14.9 per 1,000 in 1939 to 14.0 in 1941. The principal factors in this decline were the withdrawal of men for the armed forces, disruption of family life in cities when wives and children were sent to rural areas, demand for women's services in industry, and devastations by German air bombings. However, as conditions in England and Wales became stabilized, and with the bulk of the army still in the homeland, the birth rate began to rise, reaching 17.5 per 1,000 in 1944. Some of this rise may also have been due to births postponed from the few prior years. The experience of Scotland was much like that of England and Wales.

Although the wartime trend of the birth rate in England and Wales was favourable, the prospective trend of population growth there had, for some time previously, been a matter of concern. This led to the appointment, on March 2, 1944, of a Royal Commission on Population whose duty it was "to examine the facts relating to the present population trends in Great Britain; to investigate the causes of these trends and to consider their probable consequences; to consider what measures, if any, should be taken in the national interest to influence the future trend of population; and to make recommendations." The commission had three technical committees to study the statistical, the economic, and the biological and medical phases of the problems involved.

A statement by the royal commission on population, dated Sept. 1945, drew attention to the need for more facts for the study of population trends in Great Britain. It was pointed out that births averaged 1,064,000 annually in the period 1900-09; this number fell to an annual average of 701,000 during 1930-39. As a result of this downward trend, the proportion of young persons in the population decreased while that of old persons increased. The statement continued: "If the average size of family were to remain as it was before the war, a time would inevitably come when there would be more deaths than births." The commission had no evidence that the decrease in the average size of family was due to increased physiological sterility. Rather, the evidence was to the effect that the widespread practice of birth control was the direct cause of the decline in the birth rate. The statement was made by the commission that a continuance of the trend toward population decline would adversely

affect the position of Great Britain in the world. In order to obtain the needed facts regarding family characteristics, the commission recommended that a sample census be taken of married women.

The birth rate in Australia rose, year by year, from 17.4 per 1,000 in 1937 to 21.0 in 1944. New Zealand had its peak rate of 22.8 in 1941, with two subsequent years of decline. The Union of South Africa (white population) maintained its birth 1ate in the war years through 1942 at its prewar level, but turned sharply upward in 1943.

Of the German-occupied countries, Belgium had a severe drop from 15.3 per 1,000 in 1939 to a low of 12.1 in 1941, the year after her invasion; the reported rate rose thereafter, and in 1944 and 1945 it was practically at the prewar level, the rate for the last two years being 15.2. France, which had already been experiencing higher death rates than birth rates for many years, suffered a decline in her birth rate from 14.6 per 1,000 in 1939 to a low of 13.0 in 1941; at the same time, her death rate rose sharply. A rise in birth rates was reported for France from 1942 to 1944. For the occupied Netherlands, the reported birth rates were practically at the prewar level, while Norway's reports showed increases after 1941; however, these reports, like those for Belgium and France, were of questionable reliability. There were no birth reports for Poland after 1939, the year of her invasion, nor for Yugoslavia or Greece after 1940.

Of the neutral countries in World War II, Sweden was favoured with a steadily rising birth rate, except for one year; here, the rate increased from 14.4 per 1,000 in 1937 to 20.3 in 1944. Switzerland likewise showed an upward trend, from 15.0 in 1937 to 20.2 in 1945. The rise in these two countries evidently reflected their wartime prosperity. During the war years, Portugal had birth rates somewhat lower than its prewar level, while the record for Spain, based upon provisional data, showed no consistent picture.

After an examination of existing literature bearing upon the question whether the ratio of males to females at birth increases in wartime, C. Panunzio in the Milbank Memorial Fund Quarterly (July 1943) concluded that there was some evidence, not wholly conclusive, indicative of such an increase.

Fertility rates according to age of father are shown in the lower tier of Table II. By comparing, age for age, the rates for men with those for women, it will be observed that the latter had the greater rates at ages under 25, and that at the higher ages the situation was reversed. For example, at ages 15 to 19, the fertility rate for women (51.4) in 1944 was more than five times that for men (9.8); at ages 25 to 29, men had a somewhat higher rate (135.8 against 132.0), and at ages 45 to 49, their rate (19.5) was 18 times that for women (1.1).

The rise in fertility rates among men during the war period was most rapid at the youngest ages. At ages 15 to 19, the rate rose from 6.0 per 1,000 in 1939 to a peak of 10.4 in 1943; the relatively rapid gain from 1942 to 1943 in this age period was induced, quite likely, by the draft of men from age 18 up for the armed forces beginning early in 1942. The age group 30 to 34 also had a peak in its fertility rates in 1943. For the age groups from 20 to 29, the peak in the rates came one year earlier, in 1942. However, at ages 35 and over, the wartime trend in fertility rates was upward through 1944. The situation behind these movements in the fertility rates according to age of father was the same as that discussed later in connection with the fertility rates for women.

The largest relative increase in number of births from 1940 to 1943, the wartime peak year, was in families where the father was under 20 years old and the mother was of ages 20 to 24, the rise amounting to 74%.

In 1940, while the fertility rates were not yet influenced by the entry of men into the armed forces, the average age of fathers was 32 years, while that for mothers was 27½ years. The higher average age of fathers arose from their higher average age at marriage and the longer reproductive life for men than for women. More than one-tenth of the white women bearing children in 1940 were under 20 years of age; one-quarter of them were under 23 and one-half of them were under 26, but only one-tenth were over 35. In the case of white men to whom a child was born during 1940, only one-tenth were under 23, one-quarter under 26, one-half under 30, and one-quarter over 35.

Fertility Rates According to Age of Parents.-Natural population growth takes place by excess of births over deaths. But birth rates computed as the ratio of total annual births to total population give only an imperfect and often misleading gauge of the capacity for growth of the population. Actually a population may, for the moment, sustain or even increase its numbers by a balance of annual births over annual deaths, while in fact it is failing to reproduce itself. This is because the birth rate is the resultant of two influences, namely on the one hand the fertility of that part of the population which is in the reproductive ages of life; and second, the proportion of the total population which at the time is comprised within the reproductive ages. Hence, the effect of a relatively low fertility may be masked by the influence of a temporary high proportion of the reproducing contingent. Clearly, to obtain a true insight in the capacity for growth, it is necessary to probe more deeply and to examine not only the crude birth rates and death rates, but to study the fertility rates of specific contingents of the population, and, in particular, to observe age-specific fertility rates.

Statistics published by a number of countries furnished the required data to compute fertility rates according to age of mother, that is, the annual number of children of both sexes born to mothers of a specified age group, per 1,000 women within that age group. The fertility rates obtained by such a computation, for women in the United States are shown in Table II for each year from 1937 to 1944.

The fertility rate among women in the U.S. was at a peak at ages 20 to 24 years during the period of survey. In 1944, the rate, per 1,000 females, was 0.7 at ages 10 to 14; it was 51.4 for ages 15 to 19, and had a maximum of 141.7 at ages 20 to 24. The decline beyond this age group

*Rates are based upon male population of ages 55 to 59.

was gradual, reaching a level of only 1.1 per 1,000 at ages 45 to 49.

It will be noted in the upper tier of Table II, that the wartime rise in the fertility rates reached a peak in 1942 for women of ages 20 to 24 years, while women of ages 15 to 19 and of ages 25 to 34 had their peak rates in 1943. In the case of women 35 to 44 years of age, the year 1944 showed the highest rates since 1939. On the other hand, the decline in fertility rates among women 45 to 49 years in evidence before 1939 continued through 1944.

Fertility Rates According to Order of Child at Birth.—Table III exhibits for the United States and for each year from 1937 to 1944, the number of children of specified order born per 1,000 females at ages 10 to 54. In 1944, there were 20.3 first births per 1,000 women of ages 10 to 54; there were 15.9 second births, 9.2 third births, 5.0 fourth, 2.9 fifth, 3.1 sixth or seventh and 2.6 children of eighth or higher order.

Table III.—Births per 1,000 Females of Ages 10 to 54, According to Order of Child at Birth, United States, 1937–44

Order of Child at Birth	1937	1938	1939	1940	1941	1942	1943	1944
First		19.3	18.9		21.2		23.2	20.3
Second	11.6	12.3	12.3	13.0	13.6	15.2	17.0	15.9
Third	6.6	6.8	6.8	7.1	7.3	7.8	9.0	9.2
Fourth	4.2	4.1	4.0	4.1	4.2	4.3	4.9	5.0
Fifth	2.8	2.7	2.6	2.6	2.6	2.6	2.9	2.9
Sixth and Seventh	3.3	3.3	3.1	3.0	2.9	2.9	3.1	3.1
Eighth and over	3.0	2.9	2.7	2.6	2.5	2.4	2.5	2.6

Counting first births only, the fertility rate per 1,000 women of ages 10 to 54 rose from a prewar level of about 19 to a peak of 24.9 in 1942 and then declined in the next two years. Most of these first births occurred among young mothers whose husbands were, for the greater part, at ages subject to military service from the time of the first draft in 1940. The peak year in the fertility rate for second births was 1943, the rate being 17.0 per 1,000. The decreases in the rates for first and second children in the later war years may be attributed largely to the withdrawal of husbands in the armed services for overseas duty. In the case of third and fourth children, the wartime increase in the reproduction rates continued into 1944, the figures being 9.2 and 4.0 per 1,000 respectively. The fathers of these children were mostly men at the older ages, outside of the armed forces, and were sharing the benefits of the high level of employment during the war period. The fertility rates for fifth children also shared in the late wartime rise, but only to a limited degree. For children of sixth, seventh, eighth and higher orders, the fertility rates maintained their prewar downward trend through 1942, the next two years showing small increases; apparently, the prewar trend toward smaller families was hardly influenced by the wartime industrial boom.

Reproduction Rates.—In computing fertility rates it is natural to include children of both sexes. But if the problem to be considered is to what extent the population is reproducing itself from generation to generation, a more direct index is obtained by concentrating on one sex. The usual procedure is to keep count of the number of daughters produced by mothers. Just as the figures exhibited in the upper tier of Table II were computed for children of both sexes, a corresponding set of figures can be computed counting females only. The rates so computed are generally spoken of as age-specific reproduction rates, and by summing these rates for all the five-year groups within the reproductive period (and multiplying by five to allow for the 5-year range of each group) a total "gross" reproduction rate is obtained. Examples of such rates for a number of countries for the period 1937 to 1943 are shown in Table IV.

It will be noted that most of the gross reproduction

rates were not very far from unity. The significance of this fact deserves special note. A country in which the

Table IV.—Gross Reproduction Rates for Specified Countries 1937-43										
Country	193 <i>7</i>	1938	1939	1940	1941	1942	1943			
Country United States†	1937 1.06 1.08 * 1.32 1.06 3.1 * .88 1.12 * 1.19 2.14 1.24 1.24 1.06	1938 1.09 1.07 * 1.35 1.06 * * .90 1.18 1.21 * 1.21 1.21 1.21	1939 * 1.08 1.02 1.32 1.04 * .89 1.22 * 1.22 * 1.29 1.15 .93 1.66	1940 1.09‡ 1.10 .89 1.37 1.08 * * .85 1.02 * * 1.30 1.28 *	1941 * 1.15 .80 1.40 1.09 * 1.42§ * 1.37 * * 1.26 1.37 *	1.942 1.27 1.16 * 1.55 1.21 * * * * * * * * * * *	1943 1.32 1.26 * * 1.29 * * * * * 1.16 * *			
Scotland	1.0 <i>5</i> 1.44	1.07	1.05	1.04	1.06	1.08	*			
Sweden Switzerland Union of South Africa† *Not available. †White population. ‡1939–41.	.85 .86 1.48 §1940 1940		.91 .88 1.50	.89 .89 1.50	.92 1.00 1.48	1.13	1.17			

total gross reproduction rates were unity would just reproduce its population from generation to generation if there were no deaths among females from the time of birth to the end of the reproductive period. Since there are such deaths, allowance must be made for them to obtain the final criterion of a "net reproduction rate." This is effected by tracing a group of say 100,000 females from birth to the end of their reproductive period with suitable allowance for survival on the basis of current death rates at each age, and noting how many female births would occur among them if they experienced at each age their reproduction rates currently observed in the population. The ratio of the resulting total number of female births to the original 100,000 newborn females is termed the "net reproduction rate" per generation.

In Table V it is seen that the net reproduction rate for white females in the U.S. in 1937 was only 0.97, indicating that conditions of reproduction and mortality in that year were such as to lead to an ultimately declining population. However, for the next year (1938) and for the period 1939–41, the net reproduction rate was practically unity; the rate rose rapidly to a peak of 1.24 in 1943 and then declined somewhat to 1.16 in 1944. The high wartime net reproduction rates were only temporary; it was to be expected the rate would return to essentially prewar levels. England and Wales, during the period 1937 to

Table V.—Net Reproduction Rates for Specified Countries 1937–43									
Country	1937	1938	1939	1940	1941	1942	1943		
	1937 .97 .98 * .95						1943 1.24 1.16 * * 1.14 * * .90 * *		
Netherlands New Zealand Norway Scotland Spain Sweden Switzerland Union of South Africa† *Not available †White population. The figure relates to the peric \$The figure relates to the peric			1.17 1.07 .86 .92 * .83 .78 1.35	1.18 1.20 * .90 * .81 .80 1.35	1.16 1.27 * .90 * .84 .90	1.20 1.21 * * * .99	1.30 * * * * 1.05		

1942, had net reproduction rates of the order of .8, indicating a situation leading rapidly to an ultimately

declining population; the rise in subsequent years, though marked, led to a rate of only .99 in 1944. Among the other countries in Table V with prewar reproduction rates well below unity were Belgium, Denmark, Finland, France, Germany, Norway, Scotland, Sweden and Switzerland; countries with rates well above unity were Egypt, Japan and the Union of South Africa (white population).

Completeness of Birth Registration.—Even in the relatively few countries of the world providing for systematic registration of births, the quality of the records is uncertain because of the possibility that some births may fail to be reported. In order to test the completeness of birth registration within the U.S., the bureau of the census of that country provided for a birth registration test to be made in conjunction with its 1940 census of population. Census returns of infants on April 1, 1940, were compared with the birth and death certificates filed during the four-month period from Dec. 1, 1939, to the census date. A report (U.S. Bureau of the Census, Vital Statistics-Special Reports, vol. 23, p. 97, Nov. 1945) showed that during the test period, 92.5% of the actual births in the U.S. were duly registered. For white births, registration was 94.0% complete and for all other races it was 81.5%. The completeness of registration decreased with the size of the community. In cities of 100,000 or more, 97.7% of the births were registered; for cities of 10,000 to 100,000, it was 96.0%; for communities of 2,500 to 10,000, it was 92.0%, while rural areas reported only 86.5%. On the whole, registration was most complete in the states of the northeast and on the Pacific coast, and least complete in the south central states.

Person in Attendance at Birth.-Hospitalization for maternity cases in the U.S. increased steadily. In 1935, the first year for which the data were collected, only 36.9% of all births were attended by a physician in a hospital; this rose to 75.6% in 1944. Meanwhile, the proportion attended by a physician elsewhere fell from 50.6% to 17.7%, and the proportion by midwives from 10.7% to 6.4%. There was a fairly definite geographic pattern in the extent to which medical attendance at birth varied within the U.S. High percentages were usual in most of the northern and western states, while the smallest proportions of births attended by physicians were found in the south. In the following states, more than 90% of the births in 1944 were attended by a physician in a hospital: California, Connecticut, District of Columbia, Idaho, Illinois, Massachusetts, Minnesota, Montana, Nevada, New Hampshire, New Jersey, New York, Oregon, Rhode Island, Utah and Washington. Among residents of urban areas, 89.1% of the births in 1944 were in hospitals, 8.4% were attended by a physician outside a hospital, 2.3% were attended by midwives, with the remainder unspecified; the corresponding percentages for live births among rural residents were 56.9, 30.4 and 12.1. For the country as a whole, 81.0% of the white births were attended by a physician in a hospital while among the Negroes, the figure was 37.0%. On the other hand, attendance by midwives in the case of Negro births was much more frequent than among white births. The increasing use of hospital facilities at maternity was undoubtedly an important factor in reducing maternal mortality and infant mortality to their 1946 low levels. A wartime factor encouraging increased use of hospital facilities for maternity was the grant provided to wives of men in the lower ranks of the armed forces by the Emergency Maternal and Infant Care act (1943).

Research.—An analysis of some social and psychological factors affecting fertility, based on the records of native white couples in Indianapolis, Ind., was presented by P. K. Whelpton and C. V. Kiser in the Milbank Memorial Fund Quarterly, July 1943. In summarizing the first results of the investigation, the authors found that fertility among Catholic couples was 18% greater than that among Protestants. On the other hand, mixed Protestant-Catholic unions were 10% less fertile than those of Protestants alone. Jewish couples were 25% less fertile than Protestants, but this finding was based upon a small sample. The authors also found confirmation of the usual relation that fertility decreases with advance in socio-economic status, whether measured in terms of rent paid (or the equivalent rental value for home owners) or educational attainment of husband and wife. An exception noted in the upper rental brackets was accounted for by the greater fertility among home owners, for fertility rates remained low among home renters in this bracket. The variation of fertility with socio-economic status was found to be much less marked among Catholic unions than among Protestants. There were definite indications that the greater fertility of Catholic couples as compared with Protestant tended to be concentrated in the higher socio-economic

In a Canadian report on "Occupational Differences in Fertility," based upon the 1941 census (Bulletin No. F-3, Dominion Bureau of Statistics, 1945), it was found that in occupational groups in which the members were of like educational status, fertility tended to increase with income. As in other studies, it was observed that fertility decreased with advance in socio-economic status (occupations were grouped into socio-economic classes on the basis of educational level and average earnings). Except for clergymen, every occupational class had a smaller average size of family in metropolitan areas than in the country outside these areas. An earlier study on "Cultural Differences in Family Size" (Bulletin No. F-2, 1945) pointed to decreases in average size of family with advance in educational status for all religious and mother tongue groups. A report on "Trends in Canadian Family Size" (Bulletin No. F-1, 1944) showed that early marriage influenced family size by a longer reproductive period, by fewer childless marriages, and by a greater rate of issue within a given length of married life. The data also indicated a trend toward increasing proportions of childless marriages and two-child families.

A study by Paul H. Jacobson (Milbank Memorial Fund Quarterly, April 1944), using data for the white population in New York city from 1929 to 1942, showed a reduction of the differential in the birth rates among the various economic levels. This particular situation was considered indicative of a widely prevailing trend. It was found, moreover, that the recovery in the birth rate after the depth of the depression was not as rapid for the lowest economic group as it was for the highest. There was no indication that families accepting public relief increased their birth rates after receiving such support.

The sex ratio (males per 1,000 females) among live births, based on U.S. data for 1933-41, was 1,058 for the native white population (Statistical Bulletin, Metropolitan Life Insurance Company, Oct. 1944). When the age of the mother was taken into account, the ratio among live births was found to range from 1,061 at ages under 20, to 1,050 at ages 40 to 44, and 1,039 at ages 45 and over. This decrease in sex ratio with advancing age of mother was the combined effect of two factors. First, the sex ratio among stillbirths, which were not included in the

foregoing figures, was much higher than among live births—it was actually 1,293 among native whites. Secondly, the ratio of stillbirths to live births increased, with age of mother, from 27.9 per 1,000 at ages under 20, to 71.7 per 1,000 at ages 45 and over, in the period under discussion. When the sex ratio was computed for total births, including stillbirths, there was much less difference between the figures for the young mothers and for the older mothers than when live births alone were considered. Actually, for total births the ratio was 1,067 at ages under 20; it was 1,061 at ages 40 to 44, and 1,055 at ages 45 and over. (See also Birth Control; Census Data, U.S.; Death Statistics; Infant Mortality; Marriage and Divorce.)

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Bismuth

With no reports on output from the United States, the largest producer, it was impossible during the years of World War II to estimate world production of bismuth with any degree of accuracy. Known outputs during World War II were of the following order in the main producing countries:

 Peru
 675,000-1,000,000 lb.

 Mexico
 200,000- 400,000 lb.

 Canada
 7,500- 400,000 lb.

 Other countries
 90,000- 150,000 lb.

 World total
 2,200,000-3,750,000 lb.

By difference it developed that the U.S. output was 1,000,000 to 2,000,000 lb., with the minimum in 1939 and the maximum in 1942. As can be judged from the above figures, the output varied widely from year to year in most countries.

In spite of its large domestic output, the U.S. used imports of 300,000 to 600,000 lb. annually. The War Production board reported U.S. consumption at 2,004,391 lb. in 1943, 1,465,640 lb. in 1944 and 1,635,293 lb. in 1945. Of these combined totals, 47% was used in pharmaceuticals, 28% in fabricating alloys, 10% in ammunition alloys, 4% in fuse alloys, 1% in aluminum alloys and 9% in other uses. "Fabricating alloys" are largely alloys with lead, tin and cadmium, useful because of their low melting points and their lack of contraction on solidification.

In war uses, beside the ammunition solder, bismuth was employed in aluminum alloys for cylinder heads in aviation engines, in atomic bombs, radar equipment and various other uses.

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Black, Hugo Lafayette

Black (1886—), U.S. jurist, was born Feb. 27, 1886, at Harlan (Clay county), Ala. Educated at the University of Alabama, where he received his law degree in 1906, he practised law until his election to the U.S. senate in 1926 on the Democratic ticket. Re-elected in 1933, he was appointed Aug. 12, 1937, associate justice of the U.S. supreme court by Pres. Franklin D. Roosevelt. His appointment was confirmed by the senate five days later. Black main-

tained his reputation as a liberal in many court rulings. However, a disclosure by the *Pittsburgh Post Gazette* that Black had once been a member of the Ku Klux Klan, together with the newspaper's claim that he had rejoined the organization after having once resigned, caused considerable embarrassment to the administration. Black explained Oct. 1, 1937, that he had joined the Klan 15 years earlier but had never rejoined, declaring that he could not consider an "unsolicited" Klan membership card given him in 1926 as membership of any kind. Criticism continued despite this explanation, but the furore gradually subsided.

On June 10, 1946, Justice Robert H. Jackson, who was on leave from the court to act as prosecutor at the Nuernberg war crimes trial, opened a new controversy centring on Black, charging that the latter had participated in decisions involving one of Black's former law partners. Jackson's accusation said continuance of such practices would bring the high court into "disrepute." Black himself made no statements, but his supporters maintained that he had dissolved his association with the law partner mentioned some 19 years earlier and emphasized that participation in any court case was left to the discretion of the individual justices.

Black Markets

During and immediately after World War II, when sales of most goods and services were under price ceilings and a number of scarce and essential commodities were rationed to consumers, the term "black market" was generally used to cover all sales and purchases made in violation of these price and rationing regulations.

In the United States.—The use of this term, commonly associated in the public mind with extra-legal distribution systems in European countries under the German occupation, caused a certain amount of confusion in the U.S. Black markets in the U.S. did not have an existence separate from ordinary channels of trade, but rather came into being whenever a sale was made at an illegal price or, if the commodity were rationed, without the exchange of ration evidences. With few exceptions, the persons who sold goods in violation of price and rationing rules were persons who had been engaged in the sale of the particular type of goods long before the regulations were established, and the transactions took place in the same offices and shops in which the goods had long been sold.

The volume of such illegal transactions, compared with the total commercial activity of the period, was not large. The amount of black market activity in any given field, however, bore a direct relation to the severity of the shortage. In certain commodities at certain times, as for instance in the textile market during the winter of 1945-46, or in the meat crisis that recurred every spring, the combination of shrunken supply with abnormally swollen demand produced a situation in which the temptation to charge "all the traffic would bear" infected a substantial number of the sellers. In such a situation, those members of the business community willing to pay and charge illegal prices succeeded in handling a disproportionate share of the supply of the particular commodity. This aggravated the shortage in the rest of the market, and tended to create an impression among anxious purchasers that the commodity had disappeared into the black market.

In this way was created what might be called the myth of the black market, as distinct from the objective use of the term by enforcement agencies and students of the phenomenon. When a highly-wanted commodity Decame

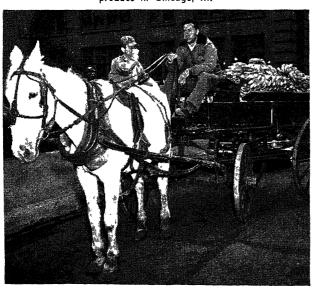
difficult to procure, every disappointed seeker was sure to have heard of at least one instance in which someone else had made a purchase under illegal circumstances. The prevalence of such stories, and the relative frustration facing legitimate purchasers, made it easy for the superficial observer to conclude that the commodity had disappeared not into the machinery of war but into some mysterious dimension known as the black market. If this black market could be discovered and destroyed, the theory ran, goods would again reappear in normal channels.

In actual fact, the transactions covered by the term black market neither added to nor subtracted from the amount of any commodity ultimately reaching the public. When such transactions became widespread in any field, however, they did act against the public interest in three serious ways. They increased the prices paid by consumers, and contributed to inflation. They distorted the fair distribution of goods, since merchants and manufacturers who were unwilling to pay and charge more than ceiling prices had more difficulty in securing supplies than less scrupulous buyers. And, when rationing or allocation orders were violated, black marketing diverted goods from more essential to less essential wartime uses.

Responsibility for preventing these violations, along with responsibility for issuing the regulations themselves, was assigned to the Office of Price Administration (q.v.). The office approached this responsibility in two ways. First, a continuing educational campaign was developed to inform industry and consumers of the provisions of the regulations and the reasons behind them. Industry advisory committees, national and local consumer organizations, newspapers, magazines, radio networks and other media assisted the government in the educational project. Thousands of volunteer assistants on local price and rationing boards explained the system of control to merchants and consumers in their own communities.

Second, an enforcement department was organized within the OPA to deal with violations that occurred in spite of all educational measures. This department consisted of units of attorneys and investigators specializing in the various commodity fields. Investigators were trained in the

Impersonating peddlers, two agents of the OPA posed as black marketeers in 1946, to test a suspected national outlet for fruit produce in Chicago, III.



business practices and bookkeeping methods of the industries to which they were assigned.

Since its investigative staff averaged only about 3,000 men during most of the period, the department operated on investigative programs carefully worked out for efficient use of manpower. Its efforts were supplemented in some fields by co-operation from the secret service and alcohol tax unit in the treasury department and occasional help from other government enforcement agencies. Civil suits for injunction, treble damages (three times the amount of any overcharge) and suspension of a seller's licence to handle goods subject to price control were prosecuted against violators by OPA's own attorneys; other cases were turned over to U.S. district attorneys for criminal prosecution. During three years and nine months of price control for which comparable figures were available (Jan. 1943 through Sept. 1946), OPA conducted more than 1,280,000 investigations and found violations in approximately 70% of the cases. An average of 4,500 civil and criminal actions was filed monthly in civil and criminal courts.

In the summer of 1944 a separate unit of highly trained criminal investigators, drawn from the FBI, treasury investigation unit, state and local police departments, as well as OPA's own ranks, was added to this department to deal with situations in which professional criminals had appeared. These investigators, the OPA special agents, were used for the first year of their existence to break up groups of racketeers engaged in counterfeiting, stealing and distributing ration currency. When, after V-J day, all commodities except sugar had been removed from rationing, the special agents were assigned to assist in getting evidence in the more devious types of price violations which appeared during the later years of the program. Determined violators developed techniques for concealing overcharges which were not readily picked up from an examination of books and records. The simplest was the payment of "side money" in cash, which was not entered on the books of either the buyer or seller. In cases in which buyer or seller had to keep books, various types of false and fraudulent invoices were developed. Most common were invoicing for a higher grade of the commodity than that actually purchased, for a larger quantity than that actually delivered, or for items that were never received. When both parties to such a transaction insistently denied that it had occurred, proof of the violation became extremely difficult. However, commodity specialists and special agents working together unmasked and stopped a great number of such conspiracies.

Commodity-wise, the most flagrant black markets appeared in gasoline and food rationing evasions—primarily through the circulation of counterfeit or stolen coupons or forged ration checks—and in meat, lumber, used automobiles and rental accommodations. (W. E. Ry.)

In Great Britain.—The most serious factor in the British black market of World War II was that it led inevitably to an increase in ordinary crime. The thieves who previously had confined themselves to stealing only certain articles widened their scope to include food, tobacco, clothes, drink and such household articles as curtains, carpets and even furniture. They knew that there was a ready sale for all these things at far better prices than a receiver of stolen goods would have paid in normal times. In the last resort the responsibility for the black market rested upon the public, who, irked by the shortage of such goods, bought them well knowing that it was unlawful to do so, without pausing to consider the origin of supply.

Although persons in all walks of life were prepared to buy things of which there were shortages, this kind of black



A Belgian black market operator on the Rue du Radis, Brussels, in 1945. Cigarettes sold at upward of 90 cents per package. British and U.S. rations, from chewing gum to meat, were either displayed or stored in pockets

market was fairly harmless in Great Britain, in the sense that it did not interfere with the national economy, because the black market in essential foodstuffs was kept under control throughout. No citizen failed to get the standard ration of meat, bread, fats and sugar, and although occasional truck loads of these articles were stolen, the total loss was small.

In eggs, poultry, tomatoes and various fruits, a large "under the counter" trade existed. Unscrupulous persons toured the country districts, buying up what they could and selling at high prices in the big towns to such an extent that the diet of persons unable to supplement their rations by underground methods became most monotonous. Black market transactions of this comparatively mild type were helped by the readiness of almost everyone to get some little extra for themselves and their families.

As World War II progressed, all other commodities, in addition to foods, came under government control. For gold, diamonds, platinum, etc., a black market hardly existed, but the control led to a large amount of smuggling from one country to another, for the reason that these commodities were regarded as stable in value, whenever the currencies of the various nations appreciated or depreciated in accordance with the fortunes of war.

As long as the prohibition on private motoring was maintained in Great Britain, the black market in gasoline was fairly small, but as the ban was relaxed the market grew. The total amount involved was made up from small deals between driver and garage owner, and it is doubtful if any big organization existed for illegal transactions. A vast conspiracy in linseed oil between a number of truck drivers and receivers was unearthed. More than 100 persons were prosecuted and long terms of imprisonment were awarded to the principals.

In Europe.—In such countries on the continent of Europe as the Netherlands, Belgium and France the black market assumed a different form. During the occupation by

the Germans, people in the big towns had to live on the black market or starve; in addition, it was considered patriotic, as the goods thus bought were kept out of the hands of the occupying forces. When liberation came, the black market remained but assumed a gray shade. Since the newly formed governments could not start the control of a proper issue of rations, all classes had to resort to the black market, and prices, although much higher than was fair or proper, were kept within the reach of most. In occupied territory where shortages were extreme and money had become less valuable, barter was often used and commodities such as cigarettes replaced currency. This method was evident in Germany, where the ordinary citizen had small use for money. Little could be bought in shops, and most transactions for essential goods were carried through by barter in the black market. In Italy also, where no confidence was felt in the future of the lira, everyone was eager to possess commodities rather than currency, and black market dealing had become universal by the end of World War II. (R. M. Ho.)

In Germany and Italy, considerable black market dealings were entered into by the occupying Allied forces. Cigarettes especially were sold (in Germany five marks for one cigarette became the general rate, varying with local conditions). The marks or lire so obtained by the soldier were used instead of drawing upon pay or were exchanged for other currencies on proceeding out of occupied territory. In this way, large amounts of unbacked marks and lire were converted into dollars or sterling. In the summer of 1946, the British authorities introduced token money as the only legal tender for the British occupying forces in Germany and thenceforward did not allow marks to be exchanged for sterling. The U.S. control commission gave effect to a similar scheme in the U.S. zone of Germany on Sept. 17.

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Blackouts

See AIR RAID DEFENSE; MUNICIPAL GOVERNMENT.

Blamey, Sir Thomas Albert

Sir Thomas Blamey (1884-), Australian army officer, was born in Wagga Wagga, New South Wales, on Jan. 24, 1884. He joined the Australian Commonwealth army in 1906, was chief of staff of the Australian corps in World War I and was knighted in 1919. He was 2nd chief of the general staff of commonwealth military forces (1923-25). In World War II, he fought with Australian forces in the middle east and was made deputy commander of British middle east armies in 1941. After Japan's attack in the Pacific area, Sir Thomas returned to Australia in March 1942. With the rank of lieutenant general, he commanded Allied land forces in the Southwest Pacific and was second in command to MacArthur. In May 1944, a bitter controversy arose between Sir Thomas and Lt. Gen. Henry Gordon Bennett, who charged that Blamey had forced him out of the Australian army because he (Bennett) was associated with the ill-fated Malaya campaign and because Sir Thomas felt that Bennett's subsequent escape from Singapore was "ill-advised." Blamey's reply was that Bennett had been placed on the retired list at his own request. Sir Thomas participated in the Japanese surrender ceremony on Sept. 2, 1945, signing the

surrender document for Australia. On Dec. 19, 1945, it was disclosed that he had been succeeded as chief of the Australian general staff by Lt. Gen. V. A. H. Sturdee.

Blandy, William Henry Purnell

Blandy (1890—), U.S. naval officer, was born June 28, 1890, in New York city, N.Y. He was graduated from the U.S. naval academy at Annapolis in 1913 at the head of his class. Specializing in ordnance work, he was advanced to the temporary rank of rear admiral and was appointed chief of the navy's bureau of ordnance on Feb. 19, 1941. He held this post until 1944, when he was transferred to the Pacific as commander of amphibious task group 1, and participated in naval operations at Saipan, Iwo and Okinawa.

On Jan. 13, 1946, Blandy, who had been raised to the rank of a vice-admiral, was made special weapons head of the navy and later became commander of joint task force 1 for the army-navy-air atomic bomb tests at Bikini atoll. Criticism of the test raged in the months before the operation took place. To charges that the test might be construed by foreign countries as a "martial gesture," Blandy answered that the operation was a "defensive measure" of caution and economy rather than one of "aggression." He also minimized the cost of the test, put at \$100,000,000, declaring it would "not exceed the total cost of one large new ship."

Following the two atomic bomb tests on Bikini (July 1 and 25, 1946)—both of which were conducted under his supervision—Blandy declared that one of the lessons learned was that warships must be redesigned to fit the needs of the atomic age. In his report to Washington on Sept. 4, 1946, he revealed that all but 9 of the target vessels were either sunk, damaged or contaminated with radioactivity in both tests. On Sept. 24, 1946, Adm. Blandy was named commander of the 8th Atlantic fleet, but under a naval reorganization plan, announced shortly thereafter, he was assigned to command the 2nd task fleet in the Atlantic.

Blitzkrieg

See TACTICS OF WORLD WAR II; WORLD WAR II.

Bloch, Claude Charles

Bloch (1878–), U.S. naval officer, was born on July 12 in Woodbury, Ky., son of a Czech immigrant. He was graduated from the U.S. naval academy at Annapolis in 1899, served in the Spanish-American war and was cited for rescuing Spanish seamen from the burning ships of Adm. Cervera's fleet. Later, he saw action in the Philippines and in China during the Boxer rebellion. During World War I, he escorted troopships and merchantmen through the Atlantic war zones to European ports. Promoted to a captaincy in 1921, he was commander of the battle force with the rank of admiral in 1936, and two years later, he was appointed commander in chief of the U.S. fleet. He retained this post until Jan. 6, 1940, when he was sent to Pearl Harbor as commandant of the 14th naval district. He was stationed at this post during the attack on Pearl Harbor, Dec. 7, 1941. Although retired because of his age in 1942, he was retained on active duty as a member of the general board with the rank of admiral. Adm. Bloch figured prominently in the secret report (published Jan. 4, 1946) of Secretary of the Navy Frank Knox on the Pearl Harbor disaster. In it Knox said that Adm. Bloch had received a radio report from a destroyer in the early morning of Dec. 7, that it had (then believed) sunk a submarine with depth charges. After giving the report some thought as the possible start of axis action, Bloch (Knox said) dismissed it in view of similar false reports in the past.

Blockade

Blockade is a legitimate form of sea warfare mainly intended to deny supplies to an enemy country. Its method of application varied from time to time until in World Wars I and II it developed into an endeavour to starve into submission. Blockading warships intercepted merchant shipping and maintained the right of search, escorting neutral ships if necessary into areas where an examination service was in force. The principles of blockade were violated to such an extent that the word largely lost its original meaning after the term "total warfare" came into existence. In the American War of Independence and in the Civil War between the northern and southern states, running the blockade was considered an honourable adventure, and the blockade runners were treated, if captured, in a humanitarian fashion. However, the introduction by Germany of ruthless submarine warfare put an entirely different complexion on the business of blockade. In World War I, the Allies captured German merchant shipping according to convention and even gave "days of grace" permits to such vessels in the early days of war, and the idea of commerce-destroying submarines sinking at sight and leaving the crew of an enemy merchantman or of a neutral ship to drown was then as repugnant as the Belsen gas chambers were to civilization in World War II. Scientific war inventions, culminating in the longrange bomber and the atom bomb, nevertheless ruled out much of the fairness attributed to blockade. Yet it seemed in 1946 that blockade would remain the major and indispensable weapon of superior sea power.

A certain amount, not much, was learned by the United States in the Spanish-American war of 1898 concerning blockade in its second or "close" blockade meaning; and of "loose" blockade, or blockade on the high seas, the most intense and culminating state was unquestionably that attained in World War II by "submerged" blockade brought about in the North Atlantic by the wolf-packs of German submarines the efforts of which cost Allied shipping millions of tons of valuable cargo and thousands of valiant lives. These blockading sea-wolves were eventually overcome by the little ships—destroyers, frigates and corvettes—the "asdic" wolf-hounds who hunted them clear of the slow-moving convoys of tramps and destroyed them more quickly than they could be built.

As long as the merchant ship remained the standard means of carrying to a country her foodstuffs, munitions and other supplies, blockade would be a vitally important factor in war, the convoy system would doubtless continue to be employed to bring in these supplies, and the fight would be between the convoy escort and the attacking forces employing such weapons as bombs, torpedoes, gunfire and mines of various description. Fighter-aircraftcarrying merchantmen as well as naval aircraft carriers would continue to protect convoys against surface commerce raiders, submarines and long-range bombers. But the gauntlet of blockade must be run as it had been in the different seas, whether on the broad ocean highways or in the narrow waters like the Mediterranean or, indeed as was seen in the years 1942-44, on sea routes that run into high Arctic latitudes. Perhaps the tanker was the most vital and at the same time the most vul-

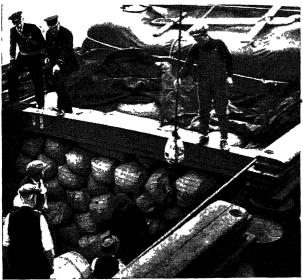
¹An electric anti-submarine detector listening apparatus.

nerable of all blockade-running craft, and the successful destruction of tankers would be as disastrous a blow to an island nation as anything imaginable when enforcing the blockade.

In World War I contraband and conditional contraband lists played an important role in ships' manifests and affected the blockading warship commanders' decisions as to search and permit to proceed, but "submerged blockade" made all forms of contraband and any other cargo lists purely futile when totalitarian war was being waged. In World War II, blockade was exercised by the Allies much more strictly. As early as 1940 Hitler was fulminating for the benefit of neutrals on the "misery" caused by the British blockade of European ports. Throughout the struggle the dominating purpose of the German war effort was to break the stranglehold which this blockade represented. As access to so many of the ports of Europe could be obtained only via the Straits of Dover, Gibraltar and Bab-el-Mandeb, the task of the royal navy during the first months of World War II was comparatively easy. Hence Germany's continual efforts to enlarge the area under the sway of its armies and so gain the use of ports in Norway and on the Atlantic coast of France. Thenceforward it was more than ever incumbent on the royal navy to maintain strong patrolling forces in the Atlantic to cover the northern and western approaches. These forces included air and submarine patrols. One of the objects of the German invasion of Norway was to secure exclusive supplies of Swedish iron ore and Scandinavian timber. The Balkans were next overrun, partly to tap fresh sources of chrome, lead, molybdenum and bauxite. Ultimately, like Napoleon, Hitler was impelled to launch an attack on Russia, convinced as he was that without her agricultural and mineral resources there was no hope for his victory.

From the outset of hostilities German merchant vessels, and later those of Italy, were precluded from navigating the high seas. Some were scuttled, but more took refuge in neutral ports in the hope of making their way home by stealth when a favourable opportunity should present itself. When the shortage of patrolling warships and aircraft which had tended to weaken the blockade in 1940–41 had been overcome, such opportunities became more and more hazardous, until by May 1944 it was possible for Lord

Cargo inspection by naval and customs officers for the British contraband control in World War II



Selborne, the minister of economic warfare, to declare that there were no longer any ocean-going blockade runners at sea. In the third season of blockade, between Nov. 1942 and May 1943, only two axis blockade runners got through out of 13. By Dec. 1943 the Germans were driven to the desperate measure of sending out from French Atlantic ports one-third of their entire available destroyer force in a futile endeavour to succour a single valuable blockade runner. Not only was the cargo lost, but three of the destroyers also were sunk.

In the Mediterranean during 1940-42 the chief task imposed on the British fleet was the interception of seaborne supplies for the axis armies in Africa. Surface vessels, submarines and aircraft together did much to weaken Rommel's position and so lead to his defeat at Alamein. Allied occupation of North-West Africa was a big step in the tightening up of the blockade of the axis powers, to whom it practically denied the use of such ports as Marseilles and Genoa for the import of supplies across the Mediterranean. It also enabled the ministry of economic warfare to take a firmer stand in its dealings with neutrals. By the employment of the compulsory system of "navicerts," 1 scarcely any overseas cargo could be loaded by neutrals without Allied approval. This system, of course, could be operated successfully only so long as the neutrals interested were convinced that any breach of Allied regulations was liable to lead to loss of cargoes and probably of ships as well. The few who tried to defy or evade the system found their names placed on a black list, and suffered accordingly. In some cases neutral ships were required, as a condition of their navicerts, to call at British contraband control ports for examination. There was a tendency to exaggerate the proportion of neutral shipping employed on German account. During the whole period of the war not more than 11/2% of Spanish and Portuguese mercantile tonnage was so operated. By 1944 this figure had been reduced to 1/2%, all of it in short voyages across the Bay of

In the later years of World War II, Germany urgently required rubber, tin and vegetable oils from the far east, while Japan was in equally desperate need of precision tools, heavy industrial plants and technicians from Europe. Efforts to run cargoes through in either direction met with the minimum of success. In 11 westbound blockade runners intercepted, the cargoes included 45,000 tons of rubber, 25,000 tons of vegetable oils and 1,500 tons of tungsten. Traffic thenceforward ceased, save for such "small parcels" as could be brought in an occasional submarine.

Attacks on axis coastal shipping in the Mediterranean, Baltic, North sea and elsewhere were another factor in tightening the blockade. Working in conjunction under the operational control of the admiralty, the royal navy and R.A.F. coastal command methodically harried axis coastwise traffic from Norway to the Aegean, contributing materially to the ultimate weakening of German resistance. Indeed, the whole blockade was well described by Lord Selborne as "a vast combined operation against the enemy's fighting power, outside and inside his frontiers, and on his coastal waters." Gradually economic warfare became concentrated upon control of the ferrous alloys, World War II being very much a "war of special steels." In 1944, agreements with Turkey and Spain went far to reduce Germany's supplies of chrome and wolfram to insignificant amounts.

Navigation certificates, delivered by British consuls in large neutral ports attested that cargo was free of contraband. A "navicert" was a "pass" through blockade.

At one period of the war, during the winter of 1943–44, British fast craft specially fitted out for the purpose contrived successfully to run the axis blockade of the Swedish ports on the Kattegat, only two vessels being lost. These were the "Gay Viking" (ex M.G.B. 506) and "Master Standfast" (ex M.G.B. 508). Cargoes so obtained consisted chiefly of ball bearings, so vital for mechanized modern war.

This material must have proved of the utmost value in the Allied advance following the Normandy landings shortly afterwards.

In the final state of the war in the Pacific, as well as in the later years of the war in Europe, mines laid by British and American aircraft were employed for blockade purposes.

Use of many North German ports on the Baltic was held up or greatly impeded by this means; and equal success was experienced in blocking Japanese harbours and the use of the narrow waters of the Inland Sea. (See Shipping, Merchant Marine; World War II.)

Thus the second World War of the 20th century drove home the lessons taught by the use of the blockade weapon in the long struggle with Napoleon. In similar circumstances the reaction of the enemy to the impact of the blockade weapon was much the same, and in the end it proved equally futile. (See also Strategy of World War II; Submarine Warfare.)

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(E. R. G. R. E.)

Blood Bank, Blood Plasma

See Gynaecology and Obstetrics; Medicine; Military Medicine, U.S.; Physiology; Surgery.

Blood Clot

See MEDICINE.

Blood Pressure

See MEDICINE.

Blue Cross

See INSURANCE.

Blum, Léon

Blum (1872—), French statesman, was born in Paris on April 9, 1872, of well-to-do Alsatian-Jewish stock. He took degrees in philosophy and law and for some years practised law. He also worked as a drama critic and wrote a number of literary works. He became a Socialist early in the century and later entered actively in politics. A deputy for the Seine department, 1919–28, he represented the Narbonne department, 1929–40. In 1929, Blum became president of the parliamentary group of the Socialist party. An outstanding figure in French politics, Blum remained in the opposition until the popular front triumph in the national elections of May 1936 and on June 4, he became the first Socialist prime minister of France.

Following a sharp clash with a hostile senate over measures for resolving the country's financial difficulties, Blum resigned June 21, 1937. In the succeeding Chautemps government, Blum was deputy prime minister, 1937–38, but declined office in the Daladier government that followed. He was prime minister for 28 days of a short-lived government in March 1938. After the fall of France in 1940, he was indicted by the Pétain regime on war guilt charges and was brought to trial at the Riom proceedings, Feb. 19, 1942. Blum's spirited attacks on his accusers discomfitted the Vichy authorities, who suspended the hearings in April and returned him to prison. Later transferred to a German prison, he was freed by U.S. troops in May 1945 from a nazi concentration camp in the Italian Alps.

Two months after his return to France, Blum appeared (July 27, 1945) as a prosecution witness at le procès Pétain, accusing the aged marshal of treason. On Jan. 28, 1946, the French socialist was named special French ambassador to foreign countries with authority to negotiate foreign loans and he went to Washington, D.C., where he signed (May 28) an agreement with the U.S. settling French lend-lease accounts and securing credits of about \$1,370,000,000.

After Bidault's resignation as premier-president in late Nov. 1946, Blum was selected as a "compromise candidate," acceptable to Communists, Socialists and a small left Republican coalition to succeed Bidault. Although in ill health, Blum accepted the post on Dec. 12, 1946, and formed his interim cabinet on Dec. 16.

Board of Economic Warfare

See WAR AND DEFENSE AGENCIES.

Board of War Communications

See Federal Communications Commission.

Bock, Fedor von

Bock (1880-1945), German army officer, was born Dec. 3, 1880, at Kuestrin on the Oder and was educated at the Potsdam military school. He entered an infantry regiment when he was 17, was a captain when Germany entered World War I, and attained the rank of major at the war's end. In 1938, Adolf Hitler named him commander of the 1st army group. During the French campaign (May-June 1940), he was in command of the lower Somme army group and on July 19, 1940, he was created a field marshal of the reich. Von Bock took command of the central German armies in the Russian campaign and dealt the Russians some of their most severe blows in the early phase of the fighting. In the fall of 1941, he unloosed six major drives against Moscow, but failed to take the city. He then began his series of "orderly retreats" and "defensive actions." Later, he was shifted to the southern front where he directed the columns that broke into Stalingrad. But his failure to wrest the city from the Russians went unappreciated by Hitler, who had him removed from his command in Oct. 1942. On May 6, 1945, it was disclosed that British forces north of Hamburg came upon the bullet-riddled body of Von Bock, who apparently had been killed a week earlier by Allied strafing planes.

Bohemia and Moravia

See CZECHOSLOVAKIA.

Boisson, Pierre François

Boisson (1894~), French politician and government official, entered the colonial service in 1920 as an assistant administrator of colonies. By 1939 he had risen high in the colonial office and was made governor general of French Equatorial Africa. After the collapse of France

in 1940, Boisson served under the Vichy regime. Forces under his command repulsed the attempt made by Free French and British forces to seize Dakar in Sept. 1940. During his tenure, Boisson ruled with an iron hand, ruthlessly suppressed pro-Allied groups and allegedly permitted German U-boats to dock at Dakar. The Allied landings in Nov. 1942 weakened Boisson's position, and on Jan. 7, 1943, he agreed to support the Allies, promising them the use of men and materials. Charles de Gaulle, on his accession to power in French Africa, dismissed Boisson on July 3, 1943; six months later (Dec. 21), Boisson was arrested on charges of treason. He was freed by the High Court of Justice sitting in Paris, Nov. 28, 1945. However, on May 14, 1946, under a government decree penalizing colonial governors who sided with Vichy, Boisson was deprived of his decorations and was forbidden ever to receive a French or foreign decoration or a pension.

Bolivia

Bolivia, a landlocked republic in south central South America, lies between approximately 10° and 23° S. lat. and 58° and 70° W. long. The area was officially computed after the adjustment in the Chaco arbitral award in 1938 to be 419,470 sq.mi.; pop. (est. Jan. 1, 1944), 3,533,-900. Population density in 1944 was 8.49 per sq.mi. The population estimate in 1941 was 3,457,000, but all estimates were obviously subject to considerable error as the latest previous national census, admittedly incomplete, had been taken in 1900. Population estimates by departments in 1943 were as follows: Beni, 65,200; Chuquisaca, 414,300; Cochabamba, 665,100; La Paz, 903,200; Oruro, 174,500; Pando, 18,300; Potosí, 659,900; Santa Cruz, 424,800; Tarija, 208,600. The legal capital and seat of the supreme court is Sucre (est. pop., 1946, 32,000) but the real seat of government is La Paz (est. pop., 301,000), located at an elevation of 12,000 ft. above sea level and the highest large city in the world. Other cities (with est. pop.) include Cochabamba (60,000), Oruro (50,000), Potosí (40,000), Santa Cruz (32,800) and Tarija (27,000). Of the total population, 52.34% was classed as Indian, 27.5% as mestizo, 13.08% as white, 0.22% as Negro and 6.85% as unspecified.

Presidents during the decade 1937–46: Col. David Toro until July 13, 1937; Lt. Col. Germán Busch, July 13, 1937–Aug. 23, 1939; Gen. Carlos Quintanilla, Aug. 23, 1939–April 15, 1940; Gen. Enrique Peñaranda, April 15, 1940–Dec. 20, 1943; Lt. Col. Gualberto Villarroel, Dec. 20, 1943–July 21, 1946; Nestor Guillén, provisional president July 21, 1946–Aug. 16, 1946; Tomás Monje Gutiérrez, provisional president from Aug. 16, 1946.

Aftermath of the Chaco War.-Effects of the disastrous Chaco War between Bolivia and Paraguay, fought between 1932 and 1935, continued to condition developments in Bolivia for several years. The war was fought as a phase of the long-continued boundary controversy involving some 100,000 sq.mi. of the Chaco Boreal. The course of the war was generally favourable to Paraguay in a military way, but it was exhausting economically to both belligerents. A peace conference, opening at Buenos Aires, Argentina, in mid-1935, did not conclude its work until three years later. Col. David Toro assumed the presidency by force in 1936 and undertook a program looking toward eventual state socialism. In March 1937 his program brought him into conflict with the Standard Oil Company of New Jersey, whose 2,500,000-ac. oil concessions in southeastern Bolivia were ordered confiscated. The Toro regime was overthrown by a bloodless coup d'état on July 13, 1937, which brought 33-year-old Lt. Col. Germán Busch, of German descent, to power as provisional presi-

dent. Busch's position was later regularized, and he became constitutional president following the adoption of a new constitution late in 1938. He adopted a middle-of-theroad policy and abandoned the extreme manifestations of state socialism favoured by Toro; he abolished the censorship in effect since the beginning of the Chaco War, invited civilians into the cabinet and promised early elections. Busch refused, however, to restore the Standard Oil concessions and organized a government corporation to exploit the oil fields. By a treaty with Argentina, dated Nov. 19, 1937, Bolivia obtained the right to export petroleum, tax free, through Argentina. Despite the early promises of Busch, his regime was oppressive, and concentration camps were filled with his political opponents. His harsh and vigorous policy resulted in 1938 in continued political instability such as had characterized the country for a decade; several abortive revolutionary attempts occurred during that year.

The Chaco peace conference, after many threatened breakdowns, ultimately succeeded in concluding a treaty on July 21, 1938, followed by an arbitral award on Oct. 10, definitively marking the long-controverted boundary with Paraguay. Bolivia surrendered about 100,000 sq.mi. of territory it previously had claimed.

The government of President Busch took several significant steps toward the economic development of the country. Bolivia signed a treaty with Brazil providing for the establishment of railway communication between the two countries and the exploration and exploitation of Bolivian petroleum to supply the Brazilian market. This development was interpreted as a partial offset to the presumed infiltration which Argentina had been gaining in Bolivian affairs, especially in connection with its petroleum resources. The government offered inducements to immigrants during 1938, including free land grants in low-lying eastern Bolivia and financial aid while getting settled, but since the government's policy was one of slow infiltration of agricultural workers it gave little encouragement to efforts to obtain a haven for refugee Jews.

Governments by Force.—Busch caused an international sensation on April 24, 1939, by his announcement of assumption of a "totality of powers." He suspended the constitution, which had taken effect only six months before, dissolved the congress and the courts and cancelled the congressional elections scheduled for the following May 4. The new move was officially described as "Bolivian in nature" and designed to "redeem Bolivia from chaos" but it was interpreted in some quarters as indicating a close economic tieup with the axis powers in Europe. At the least, it was evidence of a tightening domestic political situation. Several prominent opponents of the government were arrested on May 12 and confined in a concentration camp. Gathering symptoms of anti-Semitism were brought into focus by revelations on May 25, 1939, about payments exacted of Jewish refugees by Bolivian consuls in return for valueless passports. The resulting political scandal forced the resignation of the foreign minister; his successor also resigned, Aug. 3, 1939, but in protest against the formal nationalization of the Central bank of Bolivia. Late in the same month, Aug. 23, 1939, President Busch died of a gunshot wound under somewhat mysterious circumstances. His death was officially announced as a suicide, but many informed persons regarded it as an assassination, although no one was ever punished for it. The minister of war, Gen. Carlos Quintanilla, succeeded as provisional president despite the specification of the

1938 constitution that the vice-president should succeed to the office. The new president pledged restoration of "constitutional normality" and on Sept. 27 suspended censorship and the onerous press restrictions; he subsequently set presidential elections for March 1940. Despite pledges of noninterference with the political processes, Col. Bernardino Bilbao Rioja, commander of the army and an avowed presidential candidate, was deported to Chile on Oct. 27 for "planning a revolution." Several days of serious disorder followed.

Gen. Enrique Peñaranda, a veteran of the Chaco War, was chosen president in the elections of March 15, 1940, to succeed Quintanilla; he took office the following month despite an attempted revolutionary coup on March 26 which sought to prevent his inauguration. President Peñaranda in May decreed a general amnesty releasing all political prisoners. Political unrest continued, however, with an especially serious outbreak in July 1940 and a profound cabinet crisis in November of the same year. Peñaranda, as had been true of Quintanilla, faced repeated revolutionary threats and maintained himself in office only by the use of strong force.

The new administration co-operated at least superficially with the United States and the other American republics in maintaining hemisphere solidarity. It was generally regarded as more conciliatory toward foreign interests than any other administration of a decade past. Increasing war demands resulted in better prices for tin and other metals important in Bolivian economy, and the United States consummated an agreement with Bolivia in Oct. 1940 by which the former country contracted to purchase 18,000 tons of tin annually for 5 years and 3,000 tons of tungsten annually for 3 years. Such developments materially improved Bolivia's economic situation. The country in 1941 continued to benefit at least superficially from wartime demands for its mineral production, especially tin and tungsten, but rapidly mounting living costs and a generally unchecked inflationary wave brought on extensive strikes and labour unrest. An executive decree on Aug. 22, 1941, ordered salary increases of from 5% to 30% throughout Bolivia, but continued price rises caused serious railway and other strikes in October.

In the meantime, Bolivia's role as a producer of essential strategic war materials and its long-continued domestic disorder made it fertile soil for nazi intrigues of various kinds. Nazi propagandists were active and the Auslandsdeutsche organization made strenuous efforts to enforce conformity among the German minority in Bolivia, estimated to contain some 1,400 non-Jewish Germans in addition to 3,500 nationals of German descent. As one means of combating German influence, the government on May 14, 1941, expropriated the German-owned and operated Lloyd Aéreo Boliviano air line which had for some years been flying Bolivian routes and with Brazilian connections, all with a substantial subsidy from the German government; expropriation was undertaken with the knowledge and sympathy of the U.S. state department. Rumours of a nazi coup d'état were prevalent in June 1941, and the situation reached a focal point with the disclosure the following month of an extensive plot in which the German minister, Ernst Wendler, was the key figure; a prominent Bolivian diplomatic official in Berlin was also involved. President Peñaranda acted with energy and dispatch, expelling Wendler from the country, proclaiming a state of siege (martial law) and ordering the arrest of many political opponents. The situation remained delicate, however.

Support for the Allies.—Bolivian relations with the United States in 1940 and 1941 continued to be complicated by the question of the expropriated Standard Oil properties, for which no adjustment had been made, although in other respects relations with the United States were on a cordial basis, centring especially around problems of hemispheric defense. The United States succeeded in concluding a tungsten purchase agreement with Bolivia in 1941, despite a Japanese offer of a considerably higher unit price. After the Japanese attack on Pearl Harbor, Bolivia manifested strong official support for the United States position. In the preceding month a U.S. air mission had succeeded an Italian mission in directing the training of the Bolivian air force; the latter consisted of only some 60 planes, however.

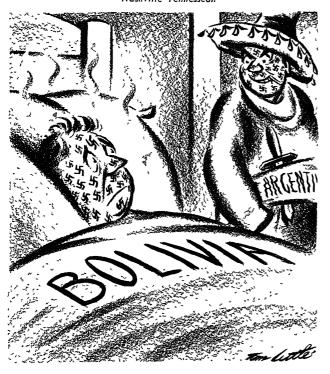
Meanwhile, on the domestic scene, miners demanded a 100% wage increase and by Dec. 14, 1942, had become so vociferous in their demands that a nationwide state of siege was decreed. The labour demands centred in the employees of the Patiño Mining company. The government's arbitrary actions in response to the demands led to the so-called Catavi massacre in December in which considerable numbers, variously estimated from 20 to 100, of miners and their wives and children were killed. Three alleged leaders of a reputed plot to overthrow the government were simultaneously arrested. The Catavi tragedy greatly antagonized the Bolivian people, thereby contributing to the growing unpopularity of the Peñaranda regime, and also had serious repercussions abroad. A semiofficial mission went from the United States to investigate the affair. When President Peñaranda visited the United States in 1943, the then chief of the labour office of the Pan American Union, Ernesto Galarza, addressed an open letter to Sumner Welles, the acting secretary of state, in which he strongly denounced the "crimes" committed against Bolivian workers.

The increasing tempo of the U.S. armament program resulted in a price increase for tin and tungsten in July 1942 and an agreement to purchase a greater annual tonnage of the two metals. The following month a Bolivian economic mission which had been invited to Washington announced at La Paz the creation of a Bolivian Development corporation as an affiliate of the Inter-American Development corporation. It was also announced that \$25,000,000 of U.S. funds would be advanced to Bolivia to be devoted to construction of 4 major highways, the establishment of a national sugar industry, the stimulation of petroleum production, the creation of a currency stabilization fund and the financing of imports from the United States. The Bolivian congress, aroused by the alleged shortcomings of the August agreement with the United States, forced the resignation of the cabinet in Nov. 1942. Soon afterward, but by a margin of only 1 vote, the congress gave its formal approval to the settlement reached earlier in 1942 by which the government agreed to pay approximately \$1,750,000 for the properties expropriated from the Standard Oil company in 1937. A further development affecting relations with the United States in 1942 was the agreement in August for the sending of a four-year military mission to direct the organization and training of the Bolivian army; the prewar influence in Bolivian military development had been primarily German. Argentina in Sept. 1942 began construction of a railway link connecting that country with Santa Cruz in the heart of the Bolivian oil fields. The line, it was thought in some quarters, was intended in part to preserve Argentine influence in competition with the transcontinental railway under construction from Arica, Chile, to Santos, Brazıl, which would help to cement economic ties between Bolivia and Brazil.

Bolivia in 1943 became the 2nd South American (and the 12th Latin-American) nation to declare was on any of the axis powers. The action was taken on April 7 while Vice-President Henry A. Wallace of the United States was in the country on an official visit. Opponents of the government charged that the step was taken merely to simplify harsh governmental control over the country. Bolivian labourers had already been registered and had been given conscript status so that essential work in the mines and in agricultural enterprises would not suffer because of loss of trained men to the army. Professional men were similarly listed in May. The same month saw establishment of censorship over all means of communication. President Peñaranda made an official visit to the United States early in May 1943 further to integrate the Bolivian effort with the war program. The U.S. government, soon after Peñaranda's arrival, announced that economic co-operation between the two countries would be intensified. President Roosevelt also apologized for the "excessive" rates charged Bolivia by U.S. bankers during the 1920s. Bolivia on June 28, 1943, reached a friendly agreement with Brazil for the exchange of raw materials, but the same year saw a somewhat strained interchange of comments with Chile over the long-lived question of a Bolivian outlet to the Pacific.

Domestic conditions continued troubled throughout 1943, chiefly because of the controversy inherited from the Catavi disaster of Dec. 1942. The joint Bolivian-U.S. commission which investigated conditions in the tin mines recommended certain reforms in working conditions, but the Peñaranda administration continued to be the subject of bitter attacks for its labour policy. Opposition came both from the Movimiento Nacional Revolucionario (M.N.R.), a strongly nationalistic party, and the Partido

"The Plague Spreads," a reference to Argentina's alleged role in the Bolivian revolution of Dec. 1943. Cartoon by Tom Little of the Nashville Tennessean



Izquierdo Revolucionario, a leftist political group. The two were not allied with one another and displayed a mutually suspicious and hostile attitude but made common cause in attacking the government. Their opposition resulted in the growth of a united revolutionary sentiment among the exploited working classes and brought about the resignation of the cabinet in Sept. 1943.

The Villarroel Regime.—The critical internal political situation came to a climax in a well-planned revolution by the M.N.R. led by Víctor Paz Estenssoro on Dec. 20, 1943. The movement was quickly successful, Peñaranda was promptly exiled and a new government was set up under Major Gualberto Villarroel. Domestic political opponents of the new regime and many foreign observers immediately charged it with nazi sympathies, especially in view of the cordial attitude manifested toward it by the military clique in power in Argentina.

The Committee for the Political Defense of the Hemisphere, a creation of the third foreign ministers' conference at Rio de Janeiro, Brazil, in Jan. 1942, resolved at Montevideo, Uruguay, on Dec. 24, 1943, that the republics of the Americas ought not to extend recognition to any new government set up by force until after mutual consultation. Bolivia was not mentioned by name in the resolution but the coup at La Paz was the obvious inspiration for the step. Although the new government announced that it would live up to all Bolivian commitments to the United Nations, the United States, along with most of the rest of the republics of the hemisphere, withheld recognition, in view of the action of the C.P.D. at Montevideo and because of the previous pro-nazi associations of several of the leaders of the revolution. Among the few hemispheric governments which did extend recognition was Argentina, which took the step on Jan. 3, 1944.

The principal problem in 1944 was the gaining of stability by diplomatic recognition of the new regime. Inter-American consultations were actively held during the early weeks of the year and resulted in crystallization of a nonrecognition policy adhered to by most of the governments of the hemisphere. The charge of Argentine inspiration for the December coup continued to be actively made in the early part of 1944. Bolivia sent Undersecretary Fernando Iturralde Chinel to the United States to try to win governmental favour, but without success. At the end of January, U.S. Ambassador Pierre Boal, who had been charged with failure to report any of the developing symptoms prior to the coup of Dec. 20, was called to Washington for consultation. Bolivia on Feb. 11, 1944, made three cabinet changes in an effort to convince the other American governments that it was not under German or Argentine influence. Expropriation of axis-operated firms was decreed on Feb. 12. The government on March 21 decreed elections for a national constituent and legislative assembly to be held July 2; the assembly was to meet Aug. 6 and elect a constitutional president. The United States early in May sent Avra M. Warren, ambassador to Panama, and Gen. Ralph Wooten, commander of the 6th U.S. air force, to La Paz to study the political situation. Warren returned to Washington on May 26 and on the basis of his report of a purge of nazi influences and following additional inter-American discussions, the United States, Great Britain and the Latin American states extended diplomatic recognition on June 23, 1944.

Víctor Paz Estenssoro had resigned as finance minister on April 2, 1944. On April 28 the government announced discovery of a "vast revolutionary plot" and proclaimed a

state of siege but declared it would not interfere with the July elections. Those elections gave strong majorities to administration candidates, the combined opposition gaining only 21 seats. A week later, July 9, José Antonio Arze, R.I.R. leader, was shot and seriously wounded. Mauricio Hochschild, wealthy tin magnate, who had been accused of complicity in an abortive revolt in April, was missing (allegedly kidnapped) early in August and after his return to La Paz he went to Chile and subsequently to the United States. (An army officer, member of a military lodge supporting Villarroel, confessed on July 27, 1946, that he and fellow officers had kidnapped Hochschild.) The constituent assembly on Aug. 6, 1944, elected Villarroel constitutional president by 79 votes against 10 for 3 opponents. The government on Nov. 19 announced discovery of a revolutionary plot at Oruro, suppressed it with several executions and ruled thereafter with an even heavier hand.

Political conditions continued disturbed, with repeated charges of repression, during much of 1945. Bodies of two opposition senators who had been missing since the unsuccessful revolution in Nov. 1944 were found in a mountain gorge near La Paz on Jan. 25, 1945; it was charged that they had been killed by the government. An unsuccessful attempt was made on March 12 to assassinate President Villarroel. Exiled Bolivians organized at Santiago, Chile, in mid-June, a Frente Democrático Boliviano with Dr. Fernando Guachalla, former ambassador to the United States, as head; the chief of the groups composing it was the long-outlawed P.I.R. headed by the exiled Senator José Antonio Arze. In the foreign theatre, Minister Gustavo Chacón announced on March 19 that relations with the U.S.S.R. would be established. The government on Sept. 28 ended diplomatic relations with the Franco regime in Spain. The earlier months of 1946 were characterized by continued chronic disorder. A general strike of mine workers set for Feb. 5, 1946, in protest against a decision of the labour court regarding dismissal pay was called off only when the supreme court reversed the lower court's decision. Censorship was imposed April 30 after discovery of an alleged plot to prevent the holding of congressional elections scheduled for May 5. The elections in May increased the strength of the M.N.R. to 13 out of 27 in the senate and 71 out of 111 in the chamber of deputies. A state of siege was imposed May 30 and oppositionists charged that the government had begun a veritable reign of terror. A railway strike of several days' duration began June 3. An abortive army air force revolt occurred June 13. The government on June 19 seized two prominent La Paz newspapers as "organs of sedition."

Assassination of Villarroel.—The final and most serious revolutionary movement began at La Paz on July 18, 1946. Two days of bloody street fighting followed, in which rebels seized the municipal hall and traffic headquarters and with weapons captured in those buildings stormed the central jail and liberated political prisoners.

President Villarroel on July 20 appointed an entirely military cabinet and took futile steps to try to arrange his escape by plane. The following day, July 21, rebels stormed the presidential palace and hurled Villarroel from a balcony to the street, where angry mobs stripped his body and hanged it twice from a lamppost. An estimated 260 persons were killed and 520 wounded in the revolution. The provisional government, which even during the fighting attempted to organize student groups for preservation of order, assumed vigorous control of the situation.

The new regime was headed temporarily by Nestor Guillén, dean of the La Paz district of the superior court; it promised a restoration of civil liberties, the holding of free elections, a political amnesty, lifting of censorship and the punishment of other officials of the Villarroel regime. On July 23 it further pledged to abide by the constitution and Bolivia's international obligations; labour groups on the same day endorsed the new government. It was decreed on July 24 that army officers might not hold

		ivia. Statistical E 1938	Pata 194	1
Îtem	Value (000's omitted)	Amount or Number	Value (000's omitted)	Amount or Number
Exchange rate	Ommied	Nomber	Omitted)	Homber
United States Great Britain		1 boliviano = 3.6 cents 140 bolivianos		1 boliviano = 2.2 cents 184 bolivianos
Finance		= £1	•	= £1
Government revenues Government	\$122,278 (£25,001) \$120,460			
expenditures Gold reserves	(£24,639) \$15,659 (£3,203)			
National debt	(£3,203) \$233,527 (£47,766)			
Transportation Railroads	(,,,	1 204:		
Highways		1,396 mi. 1,867 mi.		
Waterways (rivers)		9,882 mi.		
Communication Telephones		2,555		2 421
Telegraph lines		4,880 mi.		2,621 7,933 mi.*
Radio sets		10,000		40,000
Tin		28,416 tons 1,673 tons†		47,112 tons† 2,880 tons†
(Metal content) Silver		6,373,660 oz.		10,770,072 oz.† 17,255 tons†
Lead		14,516 tons† 20,804,000 lb	.†	17,255 tons† 32,786,811 lb.†
Crops		325,399 tons 135,583 tons		
Potatoes Barley		33,069 tons		
Tobacco Forest products		30,093 tons		
Almonds and Brazil		2 905 4*	1	
nuts		3,805 tons* 874 tons*	+	
Rubber		1,310 tons*		
Food	\$13,688 (£2,800)	• • •	\$2,398 (£595)	•••
Beverage	\$11,914 (£2,437)	•••	\$2,251 (£558)	•••
Textile	\$8,012 (£1,639)	•••	\$2,644 (£656)	• • •
Clothing	\$3,139 (£642)	•••	•••	•••
Tobacco	\$2,117 (£433)	• • •	\$824 (£204)	•••
Exports—total	\$34,613 (£7,080)	•••	\$68,177‡ (£16,896)	•••
Tin	\$23,682 (£4,844) \$2,528 (£517)	29,000 tons	\$44,521‡ (£11,034)	41,000 tons‡
Tungsten ore	(£517) \$1,894	7,055,000 oz. 2,000 tons	\$3,041	4,000 tons‡
Antimony, ores, etc	(£387) \$1,171	10,000 tons	(£1,925) \$3,700‡	19,000 tons‡
Imports—total	(£240) \$25,754	•••	(£917) \$33,756‡	
Livestock	(£5,268) \$2,353	6,496 tons	(£8,366) \$3,031‡	21,409 tons‡
Cotton textiles	(£481) \$1,469 (£300)	2,195 tons	(£751) \$891‡ (£221)	525 tons‡
Wheat	\$1,231 (£252)	43,220 tons	\$1,107‡ (£274)	66,524 tons‡
Sugar and cane products Defense	\$958 (£196)	28,431 tons	\$2,821‡ (£699)	51,553 tons‡
Standing army		04.710		10.000
personnel reserves		24,713 82,187		13,900§
personnel Military expenditures	\$31,682	411		160§
Education	(£6,480)		•••	
Primary and secon-		1 (00		
dary schools Enrolment	•	1,600		2,000 150,000
Universities		3		3
*1939. †Exports only. ‡1942. §1940. Primary only.				

civil offices; early in August, 41 prominent army officers were dismissed. Tomás Monje Gutiérrez, president of the Bolivian superior court, assumed the provisional presidency on Aug. 16 succeeding Guillén; both were members of the revolutionary junta. The new regime was engaged for some weeks after the July revolution in consolidating its position. (R. H. Fn.)

Bolivia at Decade's End.—The antagonism between the civil and the military, as a consequence of the July revolution, developed to such a point that for some time many civilians could not endure the military uniform. It was probably a pedagogical question, left for time, whether the military element would return to enjoy a better position in public opinion. It was for that reason that an attempt was being made to reorganize the army, creating a new force which would know how to fill its specific function by devoting itself to the defense of territorial integrity and to the safeguarding of domestic public order.

The public had not yet arrived at differentiating good from bad military men; the latter had filled the military institution with ignominy, creating military lodges to extort everything from the nation, and constituting a privileged caste.

Almost in the last stages of the Villarroel regime, some national representative in the chamber of deputies had impugned the conduct of the army which, leaving its orbit of action, had usuiped the governmental function. Assuming the representation of the army, the minister of defense at that time challenged one deputy to a duel because he felt that such criticism, though moderate and just, constituted an offense to the army.

With the junta at the end of its journey, pledged to constitutionalize the country by means of an electoral plebiscite on Jan. 5, 1947, the government hoped that a new army would be reborn out of its own ashes, so that it could become again the pride of a nation. (T. Gz.)

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Bombay

Capital of Bombay presidency, the city of Bombay stands at the southern end of Bombay island, 18° 55′ N., 72° 54′ E. Statistics best illustrated the growth of the city of Bombay in the decade 1937–46. The population increased from 1,161,380 to 2,500,000, the expenditure on primary education by the municipality from Rs.3,346,190 to Rs.5,341,151, the expenditure on medical relief from Rs.1,796,733 to Rs.2,414,403 and the road mileage from 51.67 mi. to 264.7 mi.

The Greater Bombay scheme, which implied the extension of the city limits and its planned development, was inaugurated in Oct. 1945 and expanded the area covered by the city from 16,761 ac. to 28,160 ac. A master plan for Greater Bombay was being prepared by experts. It contemplated the ultimate extension of the area to accommodate a population of 4,000,000, and would take in the island of Trombay and the neighbouring town of Ambarnath, the latter for the location of heavy industries.

The cotton textile industry was Bombay's leading industry. In 1936, 74 mills employed 109,760 operatives, and produced 1,236,204,871 yd. of cloth. In 1945, 65 mills in the city employed 129,510 operatives and produced 1,649,701,235 yd. of cloth. The share value of the textile mills in Bombay was approximately Rs.130,000,000. The slow rate of expansion was in the opinion of experts caused by the fact that the optimum had been reached. There was a

tendency for the industry, formerly localized in Bombay and Ahmedabad, to become decentralized. In the whole of India there were 407 textile mills employing 505,506 operatives. The number of other workshops and factories in Bombay, ranging from small establishments with a dozen hands to those daily engaging thousands of operatives, rose from 970 in 1936 to 1,130 in 1945. In 1945, 22% of the entire population of the city was engaged in industry compared with 26% in 1936. Bombay was an important disembarkation point during World War II and on Aug. 14, 1944, it was shaken by a disastrous explosion when a vessel containing 1,320 tons of high explosive blew up in Victoria dock, causing extensive damage to shipping and harbour installations.

Grave disorders followed the arrest of Congress leaders in Aug. 1942, and in Feb. 1945 there was a short-lived mutiny among the naval units in Bombay harbour. During the closing months of 1946 communal rioting broke out in the city on many occasions, following the proclamation of "direct action day" by the Moslem league.

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Bombing

See Atomic Bomb; Aviation, Military; Munitions of War; Strategic Bombing; Tactics of World War II; World War II.

Bonaire

See Curação.

Bonds

See Banking; Stocks and Bonds; War Bonds.

Bonnet, Georges

Bonnet (1889—), French politician, was born in Bassilac (Dordogne). Son of an appellate judge, he studied law, becoming a privy council probationer in 1912. During World War I he served in the French army first as a sergeant and later a lieutenant and was awarded the Croix de Guerre. A Radical Socialist, Bonnet participated in the establishment of the League of Nations and represented France at the Geneva conference in 1922. He was elected deputy for Dordogne department in 1924, lost his seat in 1928 and was re-elected the following year in a by-election. He was minister of finance and head of the French delegation to the London Economic conference in 1933, minister of commerce in 1935, and ambassador to Washington, D.C., in 1937.

In April 1938, Bonnet became foreign minister. One of the principal architects of the Munich agreement, Bonnet exercised pressure on Czechoslovakia to agree to Anglo-French proposals for cession of the Sudetenland in the "interests of peace." When the Germans annexed Bohemia and Moravia, March 15, 1939, in violation of the Munich pact, Bonnet contended that as the agreement had not yet become "effective," France was not bound to help Czechoslovakia out of its difficulties. Ten days after the start of World War II, Edouard Daladier transferred Bonnet from the foreign ministry to the justice ministry. After the fall of France in 1940, he slipped into obscurity until June 1944, when the French Radical Socialists meeting in Algiers announced his expulsion from the party. A Paris dispatch of Nov. 23, 1944, said that Bonnet had been arrested on charges of handing over planes of the Air France company to the Germans.

374 Bonneville Dam See DAMS.

Bono, Emilio Giuseppe Gaspare Giovanni de

De Bono (1866-1944), Italian army officer and fascist official, was born March 19, 1866, at Cassano d'Adda. He helped organize the fascist militia, and also handled the technical and military aspects of Benito Mussolini's march on Rome in 1922. De Bono was rewarded by the duce with the governorship of Tripolitania in 1925. In Jan. 1935, Mussolini named De Bono high commissioner for Italy's East African colonies and made him commander of the Italian armies that invaded Ethiopia from Eritrea. De Bono, however, had little ability as a general and was replaced by Marshal Pietro Badoglio, who brought the campaign to a successful conclusion. When Mussolini's regime floundered after the loss of North Africa and Sicily in 1943, De Bono was reported to have been among those highly placed fascist leaders who advocated the duce's ouster and an early peace with the Allies. He was arrested by axis authorities, was tried and found guilty of plotting Mussolini's overthrow, and, together with Count Galeazzo Ciano and other fascist "traitors," was executed by a firing squad at Verona, Jan. 11, 1944.

Bonomi, Ivanoe

Bonomi (1873—), Italian statesman, was born in Mantua. An early Socialist, he was managing editor of the famous Italian Socialist newspaper, *Avanti*, and was succeeded in this post by Benito Mussolini, then also a Socialist, in 1912. Bonomi, who was a member of the chamber of deputies from 1911 to 1924, became premier in July 1921 of a leftist coalition government. His tenure was brief, and disorders provoked by Mussolini's fascisti resulted in the downfall of his government in Feb. 1922. He left politics in 1924 to resume his law practice.

After Pietro Badoglio's resignation June 9, 1944, Bonomi again formed a coalition government. However, political cleavages soon emerged in the six major Italian political parties represented in his cabinet. This factor, added to Italy's economic difficulties, compelled his government to resign on Nov. 26, 1944. Asked to form a new government, he sought to appoint Count Carlo Sforza, an avowed antimonarchist, as foreign minister. This suggestion was flatly vetoed by Winston Churchill and Anthony Eden, and Bonomi formed a cabinet on Dec. 10, 1944, without Sforza. The Sforza incident, however, clearly demonstrated that real power in governing the affairs of Italy was exercised by the Allied military government. On June 12, 1945, the Bonomi government resigned. On March 31, 1946, Bonomi forsook his socialism and together with Vittorio Orlando and Francesco Nitti, both former premiers, created the new rightist Democratic Union party.

Bonus, Soldiers'

See VETERANS' ADMINISTRATION.

Book-Collecting and Book Prices

It may well be that the decade 1937–46 will go down in book-collecting history as the era of skepticism. Or, if it does not achieve description so definitive, none can doubt that it was a period of scholarly, often scientific, reexamination. To understand the decade best, it is necessary to go back to July 2, 1934, on which day was published simultaneously in London and New York An Enquiry into the Nature of Certain Nineteenth Century Pamphlets, an

erudite and highly readable work of bibliographical detection by two English bookmen, John Carter and Graham Pollard. The Enquiry was the crystallization of vague rumour and suspicion regarding the authenticity of certain alleged first editions of Matthew Arnold, Elizabeth Barrett Browning, Robert Browning, Charles Dickens, Rudyard Kipling, Robert Louis Stevenson, Algernon Charles Swinburne, Alfred, Lord Tennyson, William Makepeace Thackeray and others. At no time, prior to publication of the Enquiry were these suspicions general nor, for that matter, were they known to the majority of booksellers, collectors and scholars. For 30 years these slim productions were considered desirable collector's items and were accepted for what they pretended to be: privately printed productions of their authors. Most notable among these fabrications was the alleged privately printed first edition of Elizabeth Barrett Browning's Sonnets [from the Portuguese] which the fabricator foisted on the world as having been issued by Robert Browning, at Reading, in 1847. In 1930 a copy of the fabrication fetched \$1,250 at public auction, fair indication of the fabricator's success. The Enquiry indicated that Thomas J. Wise, famed bibliographer, was responsible for the fabrication. Wise, who died in 1937, did not present an effective rebuttal.

Publication of the Enquiry startled both the United States and Great Britain. One may express surprise, however, that the exposure was so long in coming. As early as 1910, Alfred William Pollard, a noted bibliographer and one time assistant keeper of printed books at the British museum, had written (in the Encyclopædia Britannica, 11th edition): "A special case of . . . spurious imprints is that of the modern photographic or type-facsimile forgery of small books possessing a high commercial value. . . . The type-facsimile forgeries are mostly of short pieces by Tennyson, George Eliot and A. C. Swinburne, printed (or supposed to have been printed—for it is doubtful if some of these 'forgeries' ever had any originals) for circulation among friends. These trifles should never be purchased without a written guarantee."

The Enquiry seems to have established a frame of mind which persisted throughout the decade. Directly inspired by it was a parallel study by Wilfred Partington, Forging Ahead: The True Story of ... Thomas James Wise (New York, 1939); and Fannie E. Ratchford's Letters of Thomas James Wise to John Henry Wrenn: Further Inquiry into the Guilt of the 19th Century Forgeries (New York, 1944). Miss Ratchford attempted to implicate Edmund Gosse and bibliophile H. Buxton Forman with Wise. Still later contributions on this same subject were published by Miss Ratchford and by Roland Baughmann, exposing, respectively, the fraudulent nature of the London, 1864 (sic) edition of Tennyson's Idylls of the Hearth and the Rugby [1864] (sic) edition of Matthew Arnold's Alaric at Rome.

Other exposures followed: Professor Robert M. Smith of Lehigh university, in collaboration with others, produced The Shelley Legend (New York, 1945) which exposed as forgeries a number of alleged Percy Bysshe Shelley letters and manuscripts which had been accepted by many biographers and bibliographers for 75 years. Professor Smith and his colleagues contended that certain members of the Shelley family, the chief perpetrators and instigators of these forgeries, had committed not only a sin against the collector but had perpetuated a mythical Shelley that the facts could not support. Similarly, A Bibliography of the Strawberry Hill Press, by A. T. Hazen and J. P. Kirby (New Haven, 1942), primarily a bibliography of Horace Walpole's printed publications, demonstrated beyond any doubt that certain large paper editions of

Walpole, which had been accepted as first editions, were, in fact, unauthorized printings produced after Walpole's death in 1797.

The critical attitude was not restricted to material offered for sale. American auction catalogues came in for a share of criticism which reached its vocal height in David A. Randall's "A Plea for a More Consistent Policy of Cataloguing by Auction Galleries," a paper delivered at a meeting of the Bibliographical Society of America (Jan. 18, 1946) and subsequently printed in the society's Papers (volume 40, second quarter, 1946). Criticism of American auction catalogues had been common among bookmen and on occasion was discussed in Publisher's Weekly (New York) and at greater and stronger length in the (London) Times Literary Supplement. Critical comparison of U.S. and British auction cataloguing centred on the fact that in Great Britain, the auction catalogues were addressed to the professional dealer (presumed to know exactly what is offered for sale); while in the United States the auction catalogues were designed primarily for the unprofessional collector. The principal criticism of American auction houses was their disposition to use descriptions which, according to the critics, often were verbose, inaccurate or not based on the best available information.

During the decade, the collecting base was broadened to put greater emphasis on, for example, not only belleslettres or the productions of fine presses, but on specific subjects, such as the first appearances in print of familiar quotations and poems; local imprints; medical material, philosophy, economics, etc. Collectors also broke away from the impossibly perfectionist standard of the 1920s when it was not uncommon for a collector to refuse a book because of some minor defect or the lack of a dust wrapper. Collectors more generally recognized that an 18th century book, for example, was completely collectable even though it lacked a half-title or a blank leaf; that bibliographic perfection was not always attainable.

Auctions.—The decade saw a major change in book auctions, with the United States taking a commanding lead. The British sale season of 1936–37 was one of the most successful in years, but the situation was somewhat reversed by 1939. When World War II broke out in Sept. 1939, the London book auction rooms considered the advisability of suspending operations for the duration but, after a brief interlude of hesitation, commenced sales in Nov. 1939. As the war progressed and the British trade discovered that it was possible, after a fashion, to maintain some degree of normal trade, auctions were held with fair regularity.

While British auction houses were struggling to maintain themselves under wartime conditions, American auction houses were deluged with thousands of items. So great was the increase in the auction trade that it was possible for several smaller houses to establish themselves in New York and elsewhere in the United States and to dispose of large quantities of lower priced material. On occasion, even these smaller houses dispersed collections of not unrespectable bibliophilic worth. After a series of incidents, the famed New York auction house, American Art Association-Anderson galleries, went out of business. A group of former employees established, in New York, the Parke-Bernet galleries which rose rapidly to prominence and became the world's leading auction house.

The period immediately preceding Pearl Harbor saw a cautious attitude on the part of American consignors, to auction which was reflected in sales of comparatively small importance. As profits increased with wartime production, the situation changed and book auctions, paced

by industry, rose to record-breaking heights. Among the more notable sales held in the United States were those of the library of Cortlandt Field Bishop, one-time owner of American Art Association-Anderson galleries and the collection of William Randolph Hearst; both sales were held in 1938. In 1939, the only sale of lasting note was the natural history collection assembled by Ormond G. Smith; in 1940, the principal American sale was of the library of John Gribbel; the library of William H. Woodin, sold in 1941, was that year's outstanding sale (the final portions of the collection were dispersed in 1943). In 1941, the Parke-Bernet galleries sold the library of A. Edward Newton, Dickensian and globe-trotting author of several books on the joys of book-collecting. The year 1944 was not notable insofar as book auctions were concerned, although it saw dispersal of the James McHenry Papers, the second and final part of the collection being sold in 1945. Principal American sale of English and American literature during the ten-year period was that of the library of Frank I. Hogan, one-time president of the American Bar association and collector extraordinary. The Hogan library, sold during the years 1945-46, cost its collector an estimated \$750,-000; the sale fetched a total of slightly under \$500,000. Among the great books that passed from the Hogan library to other buyers: a first edition of The Pilgrim's Progress, a "made-up" but nevertheless highly desirable copy (\$8,000); a copy, lacking 77 leaves, of the first edition of Chaucer's Canterbury Tales (\$13,000); a manuscript of the nursery rhyme, Old Mother Hubbard (\$3,250); the Manley-Rosebery First Folio of Shakespeare (\$50,000). In 1946, the auction season was further highlighted by the sale of the Eldridge R. Johnson collection which contained, among other treasures, the original manuscript of Lewis Carroll's Alice's Adventures Underground, subsequently printed under the title as we now know it, Alice's Adventures in Wonderland; it realized \$50,000.

Auction sales in Great Britain were not spectacular save in the matter of prices which were, in some cases, excessively high. American buyers found it virtually impossible to buy at public auction for this reason and their principal purchases were by private treaty with British dealers. Transatlantic shipments presented another trade problem, although only one recorded book shipment was lost at sea during World War II.

Bookselling in Great Britain was restricted by wartime regulations. In 1940, in an effort to prevent the flight of capital, the government imposed regulations which permitted the export of rare books and manuscripts by licence only. The method proved so onerous, and was in fact so unworkable, that the restriction was revised to apply to books and manuscripts only if they were over 75 years old or valued at more than £50. At the very beginning it was evident that the restrictions could be used by the government to prevent removal from the country of literary property which might be considered national treasure; it was not until April 1944, however, when this phase was discussed in the house of commons, that this aspect became official.

The restrictions created an anomaly: Great Britain was straining every effort to build up foreign credits in the United States, its most logical market for literary property; but at the same time Great Britain wished to control what might have become a serious draining of its cultural resources. However, there were few instances in which material was not permitted to leave the country. The restrictions which prevented the flow of capital from Great Brit-

ain also effectively prevented British dealers and collectors from purchasing rare books and manuscripts abroad save by devious methods which were seldom practised and never condoned. In the summer of 1946, however, following the grant of a loan from the United States to Great Britain, the barrier was partially removed when the Import Licensing department of the Board of Trade promulgated a set of rules and restrictions which permitted the importation of rare books and manuscripts into Great Britain under a licensing system.

During the decade prices rose, reaching inflationary heights. This condition, in both the United States and Great Britain, mostly affected books in the lower price brackets, with those in the higher levels showing small, if any, advances. The inflationary condition was caused, in part, by a lack of consumer goods which thus brought quantities of loose money into the market, combined with an influx of inexperienced collectors who, believing that rare books presented a hedge against inflation, bought not wisely but too well. Publishers' Weekly, the American book trade journal, on several occasions decried what it called "uninformed buying" while the (London) Times Literary Supplement time and again published sober strictures on the practice. As one example of many, a copy of the Kelmscott Chaucer, in the London auctions of 1944, brought £205, about twice what the book had brought at normal auction only three years before.

With virtually the whole of Europe in nazi hands, the continental book trade was in a vacuum. Many dealers in Paris and other centres overrun by the invaders sold their stocks to the nazis at the conquerors' own price or had their stock "requisitioned," although certain of the more astute dealers hid their choicest material pending the war's end. After the defeat of Germany, dealers revisited European book centres. It was found that in France book auctions had all but disappeared since they were a matter of public record and hence furnished the tax-gatherers with information that certain operators preferred to keep to themselves. As late as 1946, many of France's once outstanding shops were practically bare but there were, curiously enough, more book shops operating after the war than before. Switzerland, always dependent on Germany for rare books, was practically out of the business; while Italy was in a state of commercial chaos with the book business resembling that of Germany during the inflation that followed World War I. Throughout the continent the book business was on an under-the-counter basis with pre-

An impromptu book shop set up in the open air among the ruins of Warsaw



vailing black market prices for commodities controlling prices on the few good books available. .

Shortly before the war and during its early period, certain of the continental booksellers escaped the nazis and established themselves in the United States. Some were able to bring with them fair stocks of rare books and thus continued in business. Most of these *émigrés* established themselves in New York city, where they soon found a place in American bookselling.

Bibliographies.—Bibliographical activity, as indicated by published works, was high in both quantity and quality. In the United States the largest bibliography, in terms of persons employed, was the Federal Imprints Inventory, compiled under the supervision of the Works Progress administration. Thousands of otherwise unemployed workers throughout the nation were engaged in the task of listing books and other publications according to place of publication and date. With the coming of the war years and the consequent return of these technically unemployed persons to other employment, the Bibliographical Society of America, with funds provided by the Rockefeller foundation, commenced preparation of the notes for final publication. The Inventory had issued, but had not published, a number of the lists in mimeograph manuscript form for use in preparing a manuscript for publication. In 1944, also under the supervision of the Bibliographical Society of America, a bibliography of American literature designed to cover the period 1787-1930 was started. It was made possible by a grant from the Lilly endowment and was under the editorial supervision of Jacob Blanck; publication of the finished bibliography was planned for 1955.

Bibliographical activity in Great Britain was severely curtailed by the war. The most important works issued were: The Cambridge Bibliography of English Literature, edited by F. W. Bateson (New York and Cambridge, 1941), 4 vols.; and The Oxford Companion to American Literature, by James D. Hart (Oxford University Press, 1941). As an example of the severity of wartime restrictions, the Bibliographical society was unable to issue its 50th anniversary publication until 1945, 3 years after the society's anniversary year. The publication was The Bibliographical Society, 1892-1942. Studies in Retrospect (Bibliographical society, London, 1945). But there was every indication that Great Britain would, after removal of restrictions, again resume publication of bibliographical works. In the fall of 1946, the Bibliographical society announced that A Short-Title Catalogue of Books Printed in England, Scotland, and Ireland and of English Books Printed Abroad, 1475-1640, compiled by A. W. Pollard and G. R. Redgrave, would be re-issued. The first edition, 1926, had been long out of print, and the reprint edition was eagerly waited by bookmen throughout the world. The society also announced that work on a revision of the book was going forward.

Bibliographical publications in the United States were many. Among the most important were: A Bibliography of John Greenleaf Whittier, by Thomas Franklin Currier (Harvard University Press, 1937); Tobacco, its History Illustrated by the Books . . . in the Library of George Arents, Jr., by Jerome E. Brooks (New York, the Rosenbach company, 1938–43), 4 vols.; American Fiction, 1774–1850, by Lyle H. Wright (San Marino, the Huntington library, 1939); Cotton Mather, a Bibliography of His Works and The Minor Mathers, a List of Their Works, both by Thomas J. Holmes (Harvard University Press, 1940); Incunabula in American Libraries, by Margaret Bingham Stillwell (New York, The Bibliographical Society of Amer-

ica, 1940), which, incidentally, showed an increase of about 200% in American holdings in incunabula over the earlier census of 1919; The Carl H. Pforzheimer Library of English Literature, 1475-1700, by William A. Jackson (New York, privately printed, 1940), 3 vols.; A Bibliography of the Strawberry Hill Press . . ., by A. T. Hazen (New Haven, Yale University Press, 1942), see above; A Bibliography of James Whitcomb Riley, by Anthony J. and Dorothy R. Russo (Indianapolis, the Indiana Historical society, 1944); Short Title Catalogue of Books Printed in England, Scotland, Ireland, Wales, and British America and of English Books Printed in Other Countries, 1641-1700, by Donald Wing (printed for the Index society by Columbia University Press, New York, 1945), vol. 1 of a projected threevolume set; The Cambridge Press 1638-1692. A Re-examination . . ., by George Parker Winship (Philadelphia, University of Pennsylvania, 1945). The long-delayed bibliography of early American newspapers, by Clarence S. Brigham, finally went to press in 1946. (J. Bk.)

Book Publishing

Though there was not yet a full economic recovery in the United States in 1937, the worst phase of the depression was over. Book production was rising both in the total number of volumes manufactured and in the number of titles listed. Business casualties in publishing, during the decade 1937–46, were few and included only one old established house—the reprint company A. L. Burt. They were more than counterbalanced by important new firms, among them Duell, Sloan and Pearce and Smith and Durrell (1939); Howell Soskin (1940); Creative Age Press (1941); Roy, established by émigré Polish publishers, and Pantheon, specializing in art books (1942); and William Sloane Associates, A. A. Wynn and Boni and Gaer, all in 1946.

In addition, as testimony to the stability of U.S. book publishing, 4 publishers and a wholesale distributor celebrated their 100th anniversaries during the decade, joining some 20 other houses that had become centenarians carlier. The five included Little, Brown; Dodd Mead; Putnam's; the educational publishers A. S. Barnes; and the wholesalers A. C. McClurg of Chicago.

U.S. Book Production (Number of Titles)

			Y	eai	•					New Titles	New Editions	Total
1937										9,273	1,639	10,912
1938		٠								9,464	1,603	11,067
1939										9,025	1,625	10,650
1940										9,515	1,813	11,328
1941										9,337	1,775	11,112
1942										7,786	1,739	9,525
1943										6,764	1,561	8,325
1944										5,807	1,163	6,970
1945	-	·								5,386	1,162	6,548
1946			•				•	•	٠	6,170	1,565	7,735

Another sign of the vitality of the U.S. publishing industry was the success achieved in this period in the drive toward mass markets. The gains were made chiefly through two new publishing developments, the book clubs and the 25-cent paper-bound book.

Book Clubs.—Following the success of the Book of the Month club, many other clubs, appealing to every level of age and taste and every range of interest, had been established. Among these the depression casualties were heavy. Those that weathered the storm were joined by a new group that included the Heritage club (1937), Book Find club and Classics club (1941), Peoples' Book club (1943), Dollar Book club (1944), Junior Heritage club (1945) and Teen Age club, Negro Book club, Non-Fiction Book club, and Executives' club, all in 1946.

Of the new clubs, the Book Find club was notable for

the fact that it was launched without capital and won its following by a policy of selecting unusual books that might otherwise have been neglected. The Peoples' Book club, a subsidiary of Simon and Schuster, used two innovations in its operations: its selections were made by the membership through a poll conducted by the Gallup institute; and its distribution was linked with the mail-order house of Sears Roebuck and Co. A similar link was established by another club, the Literary guild, with the mail-order house of Montgomery Ward.

Book club membership during the decade rose to more than 3,000,000, one club alone topping the 1,000,000 mark. The two largest clubs circulated 500,000 copies, or more, of each of their selections. Through this they had become the dominant influence in the making of best sellers.

According to the findings in the survey, *People and Books*, issued in 1946, book clubs accounted for 22% of total book purchases. This, however, represented largely a net increase in book circulation, since a considerable proportion of book club membership was located in communities of less than 100,000 population, not served by book stores.

The Paper-Bound Book.—The 25-cent paper-bound book, which established itself during the decade 1937-46, made even more remarkable strides. The pioneers were the Red Seal editions issued by Modern Age in 1937 and the Penguins which, in the same year, moved from England, where they had proved a great success.

The first series to achieve mass distribution, however, was Pocket Books, a subsidiary of Simon and Schuster. A stream of other paper-bound book series followed. Among the most active were Bantam Books, organized by a publishing group consisting of the old established reprint house, Grossett and Dunlap, and the Curtis Publishing Co., magazine publishers who decided to tie in with, rather than resist, the trend to the paper-bound book. In 1946 the Penguins achieved mass distribution through a connection with the Fawcett publications, a magazine chain which, like Curtis, decided to go with the paper-book trend.

Price Protection.—Two things made the success of the paper-bound book possible. One was a technical innovation, the economical new "perfect binding" which, by use of flexible glue, eliminated stitching and other binding operations. The other was the final victory of the book trade in achieving stable pricing. This was particularly vital to the 25-cent book with its low price margin.

Booksellers' and publishers' organizations had campaigned from the beginning of the century against price cutting, especially in department stores, which frequently used books as "loss-leaders." In 1937 came the decisive legal test when Fair Trade legislation, involving price protection provisions, was upheld in the supreme court. This forced the New York state court of appeals to reverse itself in a decision it had formerly rendered in favour of the Macy department store against the Doubleday publishing company. The price-protection legislation was rendered complete, in the same year, with the passage through congress of the Miller-Tydings bill, exempting fair-trade contracts from the provisions of the Sherman Antitrust act.

Books with Other Media.—As the circulation and prestige of books increased, there was a corresponding increase in the interdependence of books and other entertainment media. Thus, newspapers and magazines found book reviews an increasingly popular feature. The Chicago Trib-

une and The Chicago Sun, the Philadelphia Inquirer and other important papers added book review supplements as separate magazine features. New daily book columns by name reviewers, such as those of Sterling North and Orville Prescott, were added; and author interviews such as those by Clip Boutell and Charles Poore became popular. Book sections in magazines grew at a similar rate; and the digest magazines, including Readers' Digest, featured book condensations.

There was a time when it was supposed that the film industry would develop independent script-writing talent and story sources of its own. The contrary happened during the decade. Writers of books continued to be brought to Hollywood as script writers, and books continued to be a main source of feature films. Perhaps the chief reason was that books came to the screen with a prestige considered well worth the large sums paid for them in promotional value. Every book sold could count upon a minimum of four other readers. At least five people, therefore, had displayed it and talked about it. Reviews had appeared in a hundred or more media with a potential circulation starting at 10,000,000. And if it had been even moderately successful, word of it had also reached millions through radio review and discussion. The advantages were reciprocal, for the filming of a book brought it enormous added sales in the reprint editions. Recognizing this promotional value, film companies offered prizes to new talents, through publishing houses-awards that in one instance topped \$100,000.

During the decade radio too became "book conscious." Like the films, it drew more and more upon book writers for its scripts. Book review programs on local stations, with local book reviewers conducting them, joined national programs. Radio commentators, even of the "hard-boiled" type like Walter Winchell, included references to current books in their comment or items about authors in their gossip.

"Information Please" and other quiz programs drew heavily upon book knowledge. Book Forum programs such as "Author Meets Critic" and "Books on Trial" showed high popularity ratings, as did "Invitation to Learning," which discussed classics.

Prizes and Fellowships.-Prize awards, already mentioned in book-film collaboration, were an interesting development of the decade. Already established prizes like the Nobel and Pulitzer prizes, the Harper prize and the Newbery Medal award for children's books gained added importance in this period, almost rivalling book-club selections in their influence on best seller lists. The publishers, E. P. Dutton and Whittlesey House, offered prizes to stimulate books of regional interest; Little, Brown and Co. offered a prize for a novelette; the Williams and Wılkins Co. for the best popular scientific book; the John Anisfeld foundation, through the Saturday Review of Literature, a prize for the best book on race relations; to be joined, later, by Julian Messner, Inc., with a prize for the best book promoting tolerance; the Yale university prizes to younger poets and the Avery Hopwood awards to new novelists and dramatists exercised great influence. The New York Herald Tribune offered three annual prizes for the best books for children in three age groups. Doubleday established the George Washington Carver award for the best novel on Negro life. New awards were offered for religious books, mystery novels, and almost every other type of book.

In addition, literary fellowships during the decade were

established by publishers, among them Houghton Mifflin, Alfred A. Knopf, Dodd Mead, Harper's, and the Bruce Publishing company. And, by 1937, what was in effect the largest system of fellowship grants in history, the cultural projects of the Work Projects administration was in full swing. Through the guide books prepared by the various state writers' projects, the impulse was given to what became a major publishing trend—the collection of folklore, the description of U.S. lakes, rivers, mountains, cities and regions; and revaluations of the U.S. past.

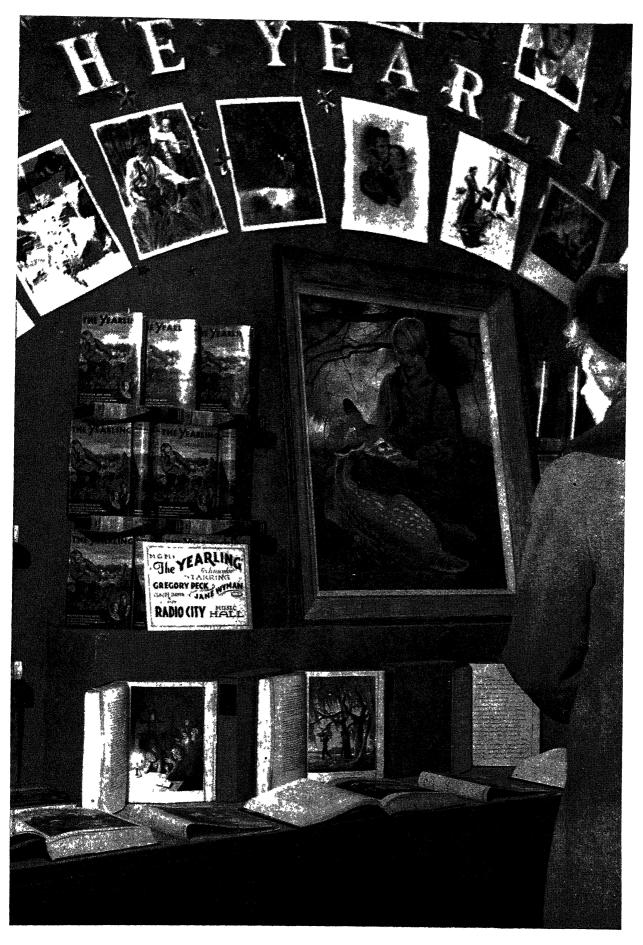
Publishing itself had an honour instituted to reward special achievement. In 1943, the first Carey-Thomas award, named after two pioneers in U.S. publishing, was instituted by Publishers' Weekly. Prizes were awarded to Farrar and Rinehart for the "Rivers of America" series, the University of Chicago Press for Sir William Craigie's Dictionary of American English, E. P. Dutton for Van Wyck Brooks's The World of Washington Irving and Knopf for H. L. Mencken's The American Language. (See also LITERARY PRIZES.)

Trade Organizations.—In the book trade itself, the trend toward organization was strong. In 1937, the National Association of Book Publishers reorganized as the Book Publishers' bureau to concentrate on legislative trade information and credit supervision. In 1945 it underwent another reorganization, emerging as the American Publishers' council. The new organization, of which Harry F. West was made executive director, undertook a program of general promotion and research with credit supervision left to a separate body carrying the old name of the Book Publishers' bureau.

The decade also saw trade union organization among book trade employees. The union first involved was the Office Workers' union, which was subsequently merged into the United Office and Professional Workers' association. The branch of the U.O.P.W.A. covering the book trade was the Book and Magazine union. Shops belonging to it included a number of publishing houses, two large bookstore chains, a book club, a large paper-book publisher and a large wholesale house.

Book Publishing in Wartime.-When war came to the U.S. in 1941, book publishing played its part in bringing victory. Publishers' lists were geared to the war effort. The industry organized itself into the Council of Books in Wartime. It publicized morale-building books, naming as "imperatives" They Were Expendable by W. L. White, One World by Wendell Willkie, Into the Valley and A Bell for Adano by John Hersey, United States Foreign Policy by Walter Lippmann, and People on Our Side by Edgar Snow. It issued reading lists and published War Atlas for Americans, which was sold at cost and helped to make clear the global nature of the war. It produced movie shorts and conducted radio broadcasts. Together with the Writers' War board, and the Book and Author War Bond committee, it took part in the victory bond drives, the Red Cross blood bank, and in collecting relief for allies of the U.S. Perhaps its greatest achievement was in producing the famous Armed Services editions, of which hundreds of millions of copies were printed. In their convenient pocket format, they became battle comrades on the front lines.

In the closing years of the war, there was a trend in U.S. publishing toward mergers and toward concentrating formerly separate branches of the book trade under single



controls. Thus the Doubleday company now owned printing and binding plants, a bookstore chain, reprint companies, several book clubs and other mail-order enterprises, and had absorbed a number of large publishing houses. Simon and Schuster, controlling Pocket Books and the Peoples' club, was bought by the Marshall Field Publishing enterprises. Other combinations occurred which contributed to the fears expressed by many in the book trade that the industry was moving toward monopoly controls.

At the same time, independent ventures continued. Individual talent remained at a premium, competed for by prizes and fellowships, and individual personality remained an important factor in the publishing industry itself. (See also COPYRIGHT.)

BIBLIOGRAPHY.—Publishers' Weekly (1937-46); Alice Payne Hackett, Fifty Years of Best Sellers (1945); Book Manufacturers' Institute, People and Books (1946).

U.S. Best Sellers, 1937-46

Fiction: Gone With The Wind by Margaret Mitchell; Macmillan Northwest Passage by Kenneth Roberts; Doubleday The Citadel by A. J. Cronin; Little, Brown

Nonfiction: How To Win Friends And Influence People by Dale Carnegie; Simon and Schuster

An American Doctor's Odyssey by Victor Heiser; Norton The Return To Religion by Henry C. Link; Macmillan

1938 Fiction: The Yearling by Marjorie Kinnan Rawlings; Scribner The Citadel by A. J. Cronin; Little, Brown My Son, My Son! by Howard Spring; Viking Press

Nonfiction: The Importance of Living by Lin Yutang; John Day With Malice Toward Some by Margaret Halsey; Simon and Schuster

Madame Curie by Eve Curie; Doubleday

Fiction: The Grapes Of Wrath by John Steinbeck; Viking Press
All This, And Heaven Too by Rachel Field; Macmillan Rebecca by Daphne du Maurier; Doubleday Nonfiction: Days Of Our Years by Pierre van Paassen; Hill-

man-Curl

Reaching For The Stars by Nora Waln; Little, Brown Inside Asia by John Gunther; Harper

Fiction: How Green Was My Valley by Richard Llewellyn; Macmillan

Kitty Foyle by Christopher Morley; Grosset Mrs. Miniver by Jan Struther; Harcourt, Brace Nonfiction: I Married Adventure by Osa Johnson; Lippincott

How To Read A Book by Mortimer Adler; Simon and

A Smattering Of Ignorance by Oscar Levant; Doubleday

Fiction: The Keys Of The Kingdom by A. J. Cronin; Little, Brown

Random Harvest by James Hilton; Little, Brown

Nonfiction: Berlin Diary by William L. Schirer; Knopf
The White Cliffs by Alice Duer Miller; Coward-McCann Out Of The Night by Jan Valtin; Alliance

1942 Fiction: The Song Of Bernadette by Franz Werfel; Viking Press The Moon Is Down by John Steinbeck; Viking Press Dragon Seed by Pearl S. Buck; John Day

Nonfiction: See Here, Private Hargrove by Marion Hargrove;

Holt Mission To Moscow by Joseph E. Davies; Simon and Schuster

The Last Time I Saw Paris by Elliot Paul; Random

Fiction: The Robe by Lloyd C. Douglas; Houghton, Mifflin
The Valley Of Decision by Marcia Davenport; Scribner
So Little Time by John P. Marquand; Little, Brown
Nonfiction: Under Cover by John R. Carlson; Dutton
One World by Wendell L. Willkie; Simon and Schuster
Journey Among Warriors by Eve Curie; Doubleday

Fiction: Strange Fruit by Lillian Smith; Reynal and Hitchcock The Robe by Lloyd C. Douglas; Houghton, Mifflin A Tree Grows In Brooklyn by Betty Smith; Harper

Nonfiction: I Never Left Home by Bob Hope; Simon and

Brave Men by Ennie Pyle; Holt Good Night, Sweet Prince by Gene Fowler; Viking Press

Fiction: Forever Amber by Kathleen Winsor; Macmillan
The Robe by Lloyd C. Douglas; Houghton, Mifflin
The Black Rose by Thomas B. Costain; Doubleday

Nonfiction. Brave Men by Ernie Pyle; Grosset

Dear Sir by Juliet Lowell; Duell, Sloan and Pearce
Up Front by Bill Mauldin; World Pub. (Oxford)

Fiction: The King's General by Daphne du Maurier; Doubleday
This Side of Innocence by Taylor Caldwell; Scribner

River Road by Frances Parkinson Keyes; Messner Nonfiction: The Egg And I by Betty MacDonald; Lippincott Peace Of Mind by Joshua L. Liebman; Simon and Schus-

As He Saw It by Elliott Roosevelt; Duell, Sloan and Pearce

Great Britain.—The period 1937-46 was the most phenomenal decade in the history of British publishing. In 1937, intensive overproduction had culminated in the biggest annual output figure-more than 17,000 titles-ever recorded in book trade annals. Six years later, stringent restriction on production having in the meantime coincided with a great expansion in reading, the output figure was the lowest on record, and glut had become famine. The table shows the great change that took place during these years. The turnover figures represent the amount of business done by publishers; the retail sum spent on books would be approximately one-third more.

British Book Publishing, 1937-46

				Prod	uction*	Tur	nover
				Total number of titles	Reprints and new editions	Publishers' total turnover	Export turnover
1937				17,137	5.810	£10,507,204	£3,146,175
1938				16.219	5.307	£10,706,018	£3,171,018
1939				14,904	4,493	£10,321,658	£3,154,599
1940				11.053	3,530	£ 9,953,196	£3,371,335
1941				7,581	2.326	£13,986,700	£3,983,900
1942				7,241	1,499	£16,735,900	£3.608.700
1943				6,705	1.201	£19,290,800	£3,469,600
1944	٠			6,781	889	£20,500,516	£4,895,349
1945				6,747	921	£21,979,584	£5,139,222
1946	٠	٠		11,411	1,508	£25,000,000	£6,000,000
						approx.†	approx.†

*Figures taken from The Bookseller, British book trade journal. †January-June turnover figures for 1946 total: £12,293,692; export, £3,095,929.

With the outbreak of war in Europe, the conditions of the British book trade, already debilitated by years of overproduction, dwindled; the 1940 figure for publishing turnover was the lowest on record. Energy was restored to the trade largely through adversity. In 1940 the government proposed a tax on books. The proposal was vehemently resisted by the trade, and the treasury withdrew books from the scope of the general purchase tax. During the air attacks on London, publishing suffered its fair share of the damage done and, on the night of Dec. 29, 1940, rather more than its share. On that night took place the great incendiary raid on that part of London known as the City, in which are situated Paternoster row, Ave Maria lane and Amen corner. These little streets, clustering round St. Paul's cathedral, were the historic centre of the British book trade and many of the older houses, including some of the largest (Oxford University press, Longmans Green, Nelson, Hutchinson), still had their businesses there. There, too, were situated the great wholesale booksellers, Simpkin Marshall, Ltd., whose stock was reputed to contain some 4,000,000 books. In the conflagration that night many millions of books were reduced to ashes.

This destruction contributed to the shortage of books that presently began to manifest itself. Because of their

scanty supplies of paper, publishers were unable to make good the losses. For the greater part of the war they were limited to a ration of 37½% of the paper they had used in 1939, a year of great political tension and general anxiety in Europe and which, for that very reason, had been a bad one for publishers.

In an effort to use their limited resources to the best advantage, the British publishers imposed upon themselves a war economy standard of book production which, by limiting sizes, widths of margins, etc., enabled them to produce the maximum number of copies from every ream of paper. Certain types of book, e.g., dictionaries and textbooks containing diagrams, were not easily adaptable to this form of compression. Moreover, it was in the field of educational books that the shortage was most acute.

Despite the fact that the publishing trade in Britain was crippled by shortages of raw materials and labour, there was an extraordinary increase in the number of publishers. The reason for this was a curious anomaly in the regulations governing the use of paper. While a book publisher established before 1939 was rigidly limited to a paper quota based on his consumption in that year, any other person in Britain was at liberty to use legally, for book production, as much paper as he could persuade any printer to supply. In 1939 the total membership of the British Publishers' association was less than 130; during the years 1942-46 there was rarely a week that did not see the registration of at least one new publishing firm. During 1945 and 1946, the tonnage of paper allocated to quota-holding publishers had increased by successive stages to 80%, and since book papers were then only a fraction of their prewar weight this tonnage provided for the output of a larger number of books than before the war. In 1946 the gap between supply and demand was shortening, but it was stated in the house of commons that 44,000 standard books were completely out of print, and 8,000 manuscripts were waiting to be published.

Europe.—The German publishing industry, best organized in the world, had by 1937 been purged of all intractable elements, and from 1939 onward constituted a docile department of the nazi ministry of propaganda. In 1944 the great book publishing centre in Leipzig was obliterated by bombs, and such organized publishing as remained was involved in the general disaster that overtook Germany in 1945. Publishing in France and the Low Countries, arrested during the five years of German occupation, had later to contend with shortages of raw material and fuel. The outstanding development in continental publishing during the decade was the renaissance of the Swiss publishing industry. After two periods of greatness, Switzerland's contribution to publishing had declined as Leipzig's importance grew. The establishment of the nazi regime in 1933 provided Switzerland with the opportunity of regaining the position it held at the time of the Reformation as the centre of free thought and international culture in the heart of the continent. (E. SE.)

Books

See Book-Collecting and Book Prices; Book Publishing; Children's Books; Libraries; see also under American Literature; English Literature; French Literature; etc.

Boothe, Clare

See Luce, Clare Boothe.

Bor, General

See Komorowski, Tadeusz.

Borah, William Edgar

Borah (1865–1940), United States senator from Idaho, was born in Fairfield, Ill., June 29, 1865. He was educated at Southern Illinois academy at Enfield, and at the University of Kansas. He was admitted to the bar in 1889 and practised at Lyons, Kan., for two years. In 1891 he went to Boise, Idaho, and devoted himself to his profession until he was elected to the senate in 1906; he was re-elected five times. Borah served as chairman of the following committees: foreign relations, Indian depredations, expenditures of the department of justice, interoceanic canals, education and labour. He opposed the entrance of the U.S. into the League of Nations and the Permanent Court of International Justice. He died in Washington, D.C., Jan. 19, 1940.

Boris III

King Boris III of Bulgaria (1894-1943), was born Jan. 30, 1894, at Sofia, eldest son of Tsar Ferdinand I and Princess Marie Louise of Bourbon-Parma. Boris ascended to the throne in 1918 after his father's abdication, successfully weathered a series of political storms during the troubled postwar period and entrenched his authority by using his police force to "liquidate" political foes. Boris paid little attention to parliamentary government during his reign. In 1934, he approved a military coup d'état engineered by the "palace guard," who suppressed the constitution, dissolved parliament and banned political parties. A year later, Boris established himself as dictator, paid frequent visits to Adolf Hitler and Benito Mussolini and geared his foreign policy to that of the axis. He was forced to give German armies the right of transit across Bulgarian territory in Nov. 1940, and to join Hitler and Mussolini in declaring war on the United States in Dec. 1941. Boris refused, however, to declare war on the U.S.S.R., aware of the great sentimental attachment of his subjects for "Mother Russia." Boris' popularity waned as the war continued. Rioting in Sofia on May day, 1943, was so serious that he was compelled to flee the capital for his own safety. His death in Sofia on Aug. 28, 1943, was both unexpected and mysterious. An official communiqué said the king had died after a brief illness, but some Hungarian sources in Berne said the king had been assassinated by one of his own police bodyguards. His six-year-old son, Simeon II (q.v.), succeeded to the throne.

Bormann, Martin

Bormann (1900–1945?), German politician, was born June 17, 1900, in Halberstadt, Germany. After World War I he participated in the German Free corps raids conducted along the Latvian frontier. Imprisoned for a political offense in 1923, he was released two years later and joined Adolf Hitler's newly-created National-Socialist party. In 1933, he became chief of staff to Rudolf Hess, then deputy fuehrer, and was also a member of the reichstag. After Hess's flight to Scotland in May 1941, the position of deputy fuehrer was vacant until Oct. 16, 1942, when Hitler designated Bormann to that post with powers exceeding even those of his predecessor. Bormann, who had great influence over Hitler, was active in the persecution of Jews throughout Europe and in fostering the slave labour program.

Of the 22 top nazi war criminals indicted by the International War Crimes Tribunal at Nuernberg, Bormann

was the only defendant not present. It was presumed that he was either dead or a refugee from justice. According to a British report on Hitler's death, Bormann cremated the fuehrer after he committed suicide April 30, 1945. Bormann, who had been named party minister in the new government designated in Hitler's last will and testament, disappeared from sight thereafter. He was indicted Aug. 29, 1945, by the Nuernberg Tribunal and was found guilty and sentenced to death in absentia by the tribunal on Oct. 1, 1946.

Borneo, British

The area known as British Borneo, as distinct from Dutch Borneo (see Netherlands Colonial Empire), before World War II comprised the three states of Sarawak, Brunei and North Borneo, all under British protection. Each of these three states was entirely separate from the other two with its own system of rule.

Sarawak.—Area c. 50,000 sq.mi.; pop. (1946 est.) 600,000, mainly Malayan and Dyak tribesmen. Chief town: Kuching (cap., 30,000). Ruler: hereditary rajah Sir Charles Vyner Brooke, the third of his line (May 17, 1917–July 1, 1946). Sarawak became, on July 1, 1946, a crown colony; governor: Sir Charles Clarke (after July 20, 1946).

North Borneo.— Area 29,347 sq.mi.; pop. (1946 est.) 300,000, two-thirds of whom are aboriginal tribes (Dusuns, Bajaus, etc.) living inland and the rest mainly Chinese (c. 50,000) and Malayan (Mohammedan) settlers on the coast. Chief town: Sandakan (cap., 13,800). Property of and ruled by the British North Borneo (chartered) company (president, Maj. Gen. Sir Neill Malcolm), which in agreement with the British government appointed its own governor. The last, C. R. Smith, took office in June 1937. On July 15, 1946, it became a crown colony; governor: E. F. Twining (appointed July 20, 1946).

Brunei.—Area 2,226 sq.mi.; pop. (1946 est.) 41,000, mainly Malayan (Mohammedan). Chief town: Brunei (cap., 12,000). Ruler: Sultan Ahmed Tajudin Akhazul Khairi Wad-din. British resident: J. Graham Black (1937–39); Major E. E. Pengilly (after 1940); W. J. Peel (after May 1946).

Prosperity Interrupted.—All three areas were distinctly prosperous, particularly Sarawak and Brunei, which had progressed rapidly after the discovery of rich deposits of oil which brought in substantial revenues. North Borneo, without any ascertained mineral wealth, was a purely agricultural country dependent principally upon rubber and timber and consequently less well placed financially than its wealthy neighbours. Nevertheless, there too the company, the last survival of a once well-established colonial system, was going steadily ahead.

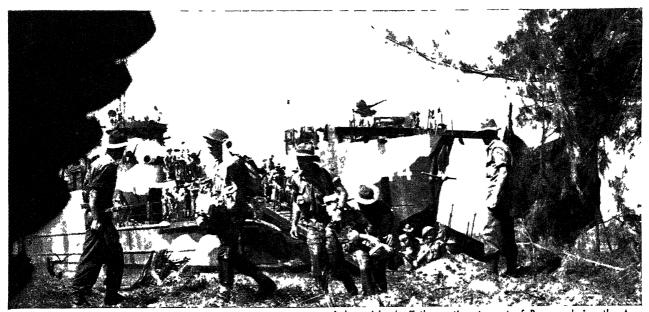
The reason was obvious. The shadow of war was growing darker over the far east until on Dec. 7–8, 1941, the crash came at Pearl Harbor. Indo-China, Siam and Malaya were quickly overrun and even Singapore was able to put up only a brief resistance. Borneo's turn followed. On Dec. 18, 1941, the Japanese landed in Sarawak; a week later they were in Brunei and on Jan. 3, 1942, they were on the west coast of North Borneo. Sandakan, the capital town, was not occupied until some time later and during the intervening weeks was in wireless communication with London. The whole country, however, was completely at the mercy of the Japanese, who by Jan. 19, 1942, were in absolute control. From that date until Sept. 1945, when the territory was reoccupied by Allied forces, very little information of the history of these protected states was

		orneo: Statistical C	afa 104	^
ltem Exchange rate	Value (000's omitted)	Amount or Number 1 Straits Dollar = 2s.4d. (56.9 cents)	Value (000's omitted) 1 S Do	Amount or Number traits lar = 2s.4d. (47 cents)
British North Borne Finance	•			
Govt. revenues . Govt. expenditures	£384 (\$1,875) £217 (\$1,062)		£503 (\$1,928) £277 (\$1,061)	
Crops Rice		25,353 tons* 15,753 tons* 822 tons*		
Buffaloes Swine Cattle	£1,139(\$5,570)	45,000* 41,000* 23,100*		
Rubber	£553 (\$2,703) £254 (\$1,242) £751 (\$3,674)	•••		
Finance Govt. revenues Govt. expenditures Minerals	£138 (\$673) £172 (\$842)		£181 (\$6 95) £170 (\$653)	
Petroleum		6,913,000†		7,047,000 †
Natural gas		3,195,000,000 cu. ft.		bbl.
Crops Rice Rubber		2,094 tons* 832 "		
Livestock Buffaloes Swine Cattle		5,100 2,500 1,300		
Exports—total Petroleum	£768 (\$3,754) £643 (\$3,145) £ 73 (\$356)			
Imports—total Machinery Rice	£ 73 (\$356) £329 (\$1,610) £ 28 (\$139) £ 23 (\$111)	•••		
Finance Govt. revenues Govt. expenditures	£496 (\$2,426) £497 (\$2,432)			
Minerals Petroleum Gold		6,913,000 bbl.† 18,520 oz.		
Crops Rice Rubber		179,675 tons 20,147 "		
Livestock Buffaloes		5,000		
Cattle Exports—total	£3,043 (\$14,875)	3,000	£5,614 (\$21,502)	•••
Petroleum products Rubber	£1,279 (\$6,255 £928) •··	£1,404 (\$5,376 £3,210 (\$12,293)	5)
Gold Imports—total	(\$4,536) £130 (\$634) £2,604 (\$12,733)		£107 (\$411) £4,004 (\$15,336)	
iron, steel and	£658 (\$3,218)	• • • •	£924 (\$3,538)	•••
manufactures .	£264 (\$1,291)	•••	£281 (\$1,076) £405 (\$1,551)	•••
Intoller and Sarawa	n.			

British Borneo: Statistical Data

available. Certainly there was desultory fighting in which many Japanese lost their lives, and in Oct. 1943 there was an ill-timed and ill-organized uprising by the Chinese in Jesselton on the west coast of North Borneo. It was suppressed with little effort but great savagery by the well-armed Japanese troops. Meanwhile the Europeans who were taken in all three states were interned in Kuching, the capital of Sarawak, except for a few highly-placed officials who were carried off first to Formosa and subsequently to Manchuria where they were finally found and liberated by the Russians.

After the end of World War II there was much discussion concerning the future organization and government of these three states, which were geographically, commercially and economically very closely allied to Malaya. Sarawak had taken the first step in 1941 when a form of constitutional government was introduced by the rajah. In 1945 the second step was taken when, not without some opposition, the rajah voluntarily handed over his responsibility to the British colonial office. In North Borneo the initiative was taken by the colonial office in the form of a letter, dated June 20, 1944, informing the president of the chartered company that it had



Labuan Island off the northwest coast of Borneo, during the Australian invasion of June 10, 1945. Japanese resistance ended within a week

"come to the conclusion that it would be desirable that on the liberation of North Borneo H. M. government should assume direct responsibility for the government of the territory." To this statement of policy the directors of the company offered no objection, as indeed they agreed on broad principles that it was a right and timely decision, and accordingly on July 15, 1946, on the termination of the period of military occupation, the colonial office replaced the chartered company as the governing authority. After prolonged discussions it was agreed that the difficult question as to the price to be paid to the shareholders in compensation for their assets in North Borneo could be fairly decided only by arbitration. Meanwhile the rich though small state of Brunei was separated from the Malayan system, and the island of Labuan with its fine anchorage was once again joined with North

These constitutional changes did not result in the amalgamation of the three Borneo territories into a single state, though it was thought that this might come later; they retained their separate entities: Sarawak and North Borneo as colonies and Brunei as a protectorate. Much romance had gone, but the tradition remained as the foundation of future progress.

The Sarawak government published on Dec. 18, 1946, an order prohibiting the entry into the state of Anthony Brooke, nephew of the former rajah, Sir Charles V. Brooke. Brooke openly and frequently expressed his intention of changing the form of government and restoring the Brooke regime. Opposition to the constitutional change was voiced mainly by a small minority of Malays who feared that their previous privileged position would be threatened.

(See also British Empire; Netherlands Colonial Empire; Netherlands Indies.) (N. Mm.)

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Boron Minerals

This heading includes a number of natural boron

compounds—borax, anhydrous, sodium tetraborate, kernite, boric acid, colemanite and occasionally ulexite. The United States normally produced about 90% of the world supply, with small amounts from Argentina, Italy and Turkey.

The largest use of borax continued to be in glass, and it was here that war demand was most evident. On the other hand the second largest use was in porcelain enamels, and so long as the production of refrigerators, washing machines, kitchen utensils and similar articles was restricted, consumption declined. It was the reconversion of these industries from war production, supplemented by an improvement in the export market, that led to the increased activity in the production of boron minerals in 1945.

Boron Minerals in the United States (Short tons)

							Sales	B ₂ O ₃ Content	Value	Exports	able Supply
1937							358,898		\$7,232,897	154,052	204,846
1938							215,662		4,739,291	77,519	138,143
1939							245.284	81.800	5,689,797	91,139	154,145
1940							243.355	80,900	5,643,390	64,313	179,042
1941							301.282	95,200	6.785.662	41,793	259,490
1942							226,723	77,600	5,733,648	36.542	190,181
1943								87,600		26.877	229.756
1944						:	277,586	91,700	6.579.587	32.759	244.827
1945		-				:				43,577	282,359

During the years of World War II a new development was the use of boron as a supplementary hardening agent in alloy steels; while this step was important technologically, it had little effect on production since the amounts used were so small, usually only thousandths of a per cent in the finished steel. (G. A. Ro.)

Boston

Capital of the state of Massachusetts, with an area of 46.1 sq.mi. where the Mystic, Charles and Neponset rivers meet Massachusetts bay, Boston ranked ninth among cities of the United States in 1940, with a population of 770,816 (federal census). The population was 766,386 by the 1945 state census. The latter figure marked a decline of 0.6% in five years, a decline of 1.3% in the decade following the 1930 federal census, and a decline of 6.3%

in the decade after 1935, when the maximum of 817,713 was recorded by state tabulation.

While only one-sixth of the population of Massachusetts (4,316,721 in 1940; 4,493,281 in 1945) resided in Boston, about half lived in the metropolitan area. Actually there were many zones, including Boston and a varying number of cities and towns, designated for specific purposes. The metropolitan transit district comprised the 14 municipalities served by the Boston Elevated railway; 25 were in the Boston postal district; 20 had a metropolitan water supply; 33 a common sewerage system. The state census recognized a metropolitan Boston, including 43 municipalities with 2,066,100 inhabitants in 1945, a ten-year increase of 2.2%. Larger still was the metropolitan Boston of the 1940 federal census, with 83 cities and towns, an area of 1,097.5 sq.mi., and a population of 2,350,514, a ten-year gain of 1.8%. Only four metropolitan areas in the U.S. (New York, Chicago, Los Angeles, Philadelphia) surpassed Boston.

City Government and Politics.—Boston was governed by a mayor and council under a charter passed by the state legislature (Ch. 486 of Acts of 1909) and subsequently amended. No major changes occurred in the decade 1937–46, but in the latter year the legislature met a growing civic demand for improvement by creating a Special Charter commission to consider such alternatives as the city manager system with proportional representation or piecemeal amendment of the old charter. Elections, nonpartisan and separate from state and national elections, occurred in November of odd-numbered years. The mayor (4-year term) and councilmen (one from each of the city's 22 wards, with 2-year terms) took office the first Monday of the following January.

Four different mayors served within the decade. Frederick William Mansfield completed his term in 1937. Maurice Joseph Tobin won the November election by a 25,000 plurality over former Mayor James Michael Curley. In 1941 Tobin again defeated Curley by 9,000. When Tobin won the election for governor of Massachusetts in 1944, he resigned as mayor and John E. Kerrigan, president of the city council, became mayor for the unexpired term. In 1945, by capturing 114,930 of the 247,477 votes cast, Curley defeated Kerrigan and four other contestants for the mayoralty.

James M. Curley, at the age of 71, became mayor of Boston for the fourth time in his colourful career, having won the elections of 1913, 1921 and 1929. Since he also had served two years as governor of Massachusetts (1935-36), his return to city hall heightened the contrast with his rival Tobin installed at the state house on Beacon hill. Moreover, Curley still kept his seat in congress as representative from the 11th Massachusetts district. Both locally and nationally he stood in a strong light because during the mayoralty race he was under federal indictment charging use of the mails to defraud, back in 1941. Curley was convicted Jan. 18, 1946, and on Feb. 18 sentenced to 6 to 18 months in prison and \$1,000 fine, out of a possible 47 years and \$19,000 penalty. He promptly appealed; and, when three days later a brass band, 22 police and a crowd of 10,000 greeted his return to Boston, he informed the public that his case would probably not be reached until April 1947, "so I'll have ample time to conduct the duties of both positions without interference."

Role in World War II.—The city of Boston sent 90,000 men and women into the armed forces, of whom 2,700 died in service. Supporting activities of the metropolitan

area were so varied and vital as to defy enumeration. Highlights were: Shipbuilding by Bethlehem in Quincy and Hingham, the navy yard and dry dock in Charlestown and South Boston; turbines, radar and other electrical products by General Electric in Lynn, Raytheon in Waltham; heavy ordnance at Watertown arsenal; small arms, ammunition, machine tools in scores of specialized plants; engineering for the Manhattan Project by Stone & Webster; research for army, navy and the Office of Scientific Research and Development by personnel of Harvard, Massachusetts Institute of Technology and Boston university; Red Cross blood donor centre visited by thousands.

Business and Financial Activity.—There were two contrasting periods of business activity; upon a basic moderate rise through 1940 was superimposed a sharp jump during the war. Bank clearings, for example, rose from \$12,106,585,000 in 1940 to \$19,591,000,000 in 1945; gross postal receipts from \$17,050,182 to \$22,661,381; the department store net sales index from 71.2 to 113.5; passenger traffic on the Boston Elevated railway from 294,451,000 to 420,096,000; average number of wage earners in the Boston industrial area from 249,523 to 348,436 in 1944.

The property tax levy showed a downward trend to 1944 (\$57,500,000), sharply reversed in 1945 (\$62,900,000) and 1946 (\$64,500,000). For, though the tax rate climbed unsteadily (1937=\$37.80; 1945 high \$42.50; 1946=\$42.00), assessed valuations real and personal shrank 27% from the 1930 peak (\$1,972,000,000) to 1944 (\$1,442,000,000), then rose 6.5% to \$1,536,385,600 in 1946. Tax collections steadily improved from 72.3% in 1937 to 89.7% in 1945, while the ratio of total debt to valuation was reduced from 8.2% to 6.4%. Current expense borrowing tapered off sharply in the three years prior to 1946, but was resumed under the Curley regime.

Postwar Picture.-Relying on the achievements and trends of the decade, Boston by 1946 was committed to physical development along many lines of public improvement and private construction. Logan airport grew rapidly, with \$30,000,000 authorized and a program calling for \$20,000,000 more. The Boston port authority received enlarged scope by the 1945 law, with \$11,000,000 authorized for new piers. Authorizations for traffic relief included off-street parking in downtown Boston (\$5,000,000) and a Mystic river bridge (\$20,000,000), while plans for a second East Boston traffic tunnel (\$15,000,000) and extension of rapid transit routes and equipment (\$46,000,000) awaited legislative action. Housing projects (\$10,000,000) were delayed by administrative conflicts. Largest private construction projects under way were Edison company's expansion and modernization (\$40,000,000), New England Telephone's five-year program (\$90,000,000), the John Hancock office building (\$15,000,000) and General Motors' assembly plant (\$12,000,000) in Framingham.

Boston's achievement and its commitment, however, were only partly represented by physical size and dollar valuation. The real Boston of the 1930s and 1940s was an idea, just as it had been in the 1630s, at work in the lives of its people.

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Botanical Gardens

The Brooklyn Botanic Garden Record (1937) listed and described more than 525 botanical gardens and related institutions in various parts of the world, and the

Committee on Botanical Gardens and Arboretums, American Association of Nurserymen (1939) listed and described about 150 such institutions in the United States alone. The latter list showed that there were 18 states in the U.S. with no botanical gardens or arboretums. These lists failed to report some well-established gardens and of course failed to report herb, drug and other gardens maintained by private individuals or institutions and open to the public free or with fees. The two lists showed, however, the great public interest in these outdoor exhibits of plants. In most cases these exhibits were accompanied by greenhouse exhibits and by researches in various lines of plant science. While these institutions naturally gave more attention to systematic botany than to any other phase of the science, physiology, pathology, genetics and biochemistry also received considerable attention, and much attention was given to practical horticulture and some to applied agriculture.

That the interest in botanical gardens and arboretums increased greatly during the decade 1937-46 and was still increasing at the end of that period was made evident by several facts; the new gardens organized just previous to or during the decade; enlargement and increased facilities in the older gardens; and new gardens projected for the future. During the last half of the decade the projected growth of gardens was decidedly hindered by World War II. Within the battle zone great destruction rather than improvement was the rule, while outside the battle zone war demands for material and manpower stopped nearly all activities beyond scant maintenance. During the war many botanic gardens shifted their emphasis to war needs, such as instruction and direction in vegetable gardening, aid in use of plants for camouflage, and instruction, especially in the Pacific, on native plants that were poisonous or could be used as food.

New Gardens of the Decade.-The Cornell University arboretum, established in 1935, was developed largely in the decade 1937-46. The name was changed in 1944 to Cornell plantations with a great extension in scope of activities. It was to embody the whole series of enterprises based on the land including animal as well as plant studies. A 16-page quarterly magazine was started in 1944. Three thousand acres of land, including those of the university and state agricultural colleges were to be developed as an integral unit under the direction of Dr. L. H. Bailey. A study would be made of the effect of climate, sites, soils, etc., on plant societies. There were to be permanent areas, areas planted as beauty spots, and recreational and agricultural areas. This was a notable development in the field in that it combined behind the botanical garden idea all the developments of a large university concerned with plant or animal science.

The Montreal Botanical garden belonging to the city of Montreal also was developed almost entirely during the "eventful decade." It contained about 600 acres of developed and undeveloped land valued at \$3,000,000, and \$6,000,000 was spent on development and construction largely during 1937-39. It was adequately equipped to carry out every function of a botanic garden. The large administration building housed offices, laboratories, library, herbarium, lecture hall, etc. It had 23 service greenhouses, and provision was made for large display greenhouses. It had special gardens covering the following subjects: annual flowers, perennial displays, fruits and berries including grapes, medicinal, economic, and water and bog (109 basins) plants, alpines, and a fruticetum. There were school children's vegetable gardens and a model vegetable garden for a family of five. The founder and first director,

Dr. F. Marie-Victorin, was killed in an automobile accident in 1944 and was succeeded by Dr. Jacques Rousseau. Henry Teuscher was named curator of the botanical garden and of the city parks and greenhouses in 1935.

The Fairchild Tropical garden at Coconut Grove, Fla., a beautiful collection of tropical trees and shrubs, was dedicated March 23, 1938. The botanical garden in Halliday park, Indianapolis, Ind., was opened in 1940. It included a systemic collection and rock, water and desert gardens were planned. The Hamilton arboretum, Irvington, N.Y., under the auspices of Columbia university, was also opened during the decade.

Although under consideration as early as 1933-35, the University of Washington arboretum at Seattle, Wash., had its main development within the decade. Besides growing many woody plants (oaks, magnolias, conifers, maples, dogwoods, flowering quinces, etc.) it carried out extensive hybridizations of azaleas and rhododendrons collected in China and obtained from Arnold arboretum, Forest Hill, Boston, Mass., Kew, London, Eng., and Edinburgh botanical gardens. In 1945 the arboretum held its first exhibit of hybrids of these plants resulting from 1940 crosses. A number of hybrids appeared that were superior in colour to those already on the market. The arboretum also developed a garden of camellias and related species consisting of about 200 varieties, and planned greatly extended activities under increased appropriations for the postwar period. The director, Dr. John H. Hanley, spent six months at Kew in 1946 to make observations for use in the future development of the arboretum.

Changes in Older Botanical Gardens.-In 1939-40 the Netherlands government planned combining various plant science institutions of Java with the government gardens at Buitenzorg. The garden already consisted of a museum, herbarium, aquatic experiment station, and the Treub laboratory. The institutions to be added were the government agricultural experiment station, the forestry experiment station, the agricultural station of West Java working on quinine, rubber and coffee, and the chemical and technical laboratory dealing with plant pathology, physiology, biochemistry, etc. The sugar experiment station in East Java and two tobacco experiment stations were not included in the consolidation. The war and Japanese occupation prevented the execution of this plan and stopped most work in the institutions. Other damage was slight.

All the botanical institutions connected with Harvard

were combined in 1935 and put under the directorship of Dr. E. D. Merrill as professor of botany, administrator of botanical collections, and director of Arnold arboretum. During the decade 1937-46 there was a great increase in the collection of living materials to a total of 6,500 species and varieties of woody plants. The taxonomic collections were broadened especially with materials from Asia, Malaysia and Papuasia. Resident botanists in this vast area, financed by the arboretum, collected much plant material especially in China, New Guinea, the Solomons, and regions of Africa and North and South America. Material additions were also made by the later extensive collections of the Richard Archbold expedition. Reference collections in the library increased, and important contributions were made to botanical bibliography: E. D. Merrill and E. H. Walker, Bibliography of Eastern Asiatic Botany (1938); Merrill, Botanical Bibliography of the Pacific Islands (in press, 1946); Alfred Rehder, Bibliography of Cultivated Trees and Shrubs (in press, 1946); and

Merrill, Index Rafinesquianus (in preparation in 1946). The staff rendered much assistance to the war effort in chemical warfare, made an Alaska military highway survey, assisted the Army Medical school and aided army officers on plant problems from New Caledonia to Upper Burma. "Plant Life of the Pacific World" was prepared especially for the war servicemen in this region.

As early as 1925 the Missouri Botanical garden had found that the smoke of St. Louis was interfering seriously with the growth of conifers and other plants in the 75acre city garden. At this time it purchased 1,600 acres of land at Gray Summit, 35 miles west of the city. During the decade 1937-46, looking forward to better varieties for the middle west, it gave much attention to developing on this land azalea gardens, many acres of naturalized daffodils of many varieties, a crabapple orchard of many new varieties and hybrids, and a boxwood garden (dedicated by the Federated Garden Clubs of Missouri, 1946) consisting of many varieties from the Balkans. The garden continued operating a stock and a general farm on this land, connecting the operations with its scientific work. It moved all the extensive investigations on orchids, including hybridization, water culture, and study of light relations, to the 12 large ranges of greenhouses at the arboretum. These studies proved of great value to amateur and professional orchid growers. At the city garden the culture of succulents and bromeliads was greatly increased through collections by Ladislaus Cutak from Florida, southwest U.S. and northern Mexico. The large palm house was modified to shelter this collection. The garden made studies on the genetics of yeast (Dr. Carl C. Lindegren) and held a conference of 50 specialists (1945) on "Gene Action in Microorganisms" and reported the conference in the garden Annals. It also made extensive studies of the origin of maize and the history of its cultivation (Dr. Edgar Anderson) and co-operated with a hybrid corn producer on corn breeding. It closed the Panama Canal Zone station in 1939 but renewed this connection in 1946 with Paul H. Allen as tropical collector. It published the first volume on the flora of Panama in 1943 and continued later publications on this subject.

During the decade, Brooklyn Botanic garden added two new "gardens within a garden": the herb garden (1938) containing examples of Elizabethan knot gardens and specimens of culinary, medicinal and poisonous herbs, and the Dean Clay Osborne Memorial, showing how to use ordinary material in making attractive ornamental gardens. In 1940 the garden reached the maximum in registration in garden courses, 1,359 against 973 in 1936. In 1945 it established a teaching fellowship in honour of Ellen Eddy Shaw, who retired as curator emeritus of elementary instruction. On Aug. 9, 1943, Dr. C. Stuart Gager died; he had been director for 33 years, since the inception of the garden. Dr. George M. Reed was acting director for nearly a year, after which Dr. George S. Avery, Jr., became director. In 1945 Garden Record was changed to Plants and Gardens, which published articles of outstanding horticultural interest or of especial value to laymen as well as news about the garden. The garden installed a new laboratory in plant physiology under the direction of Dr. Avery. Dr. Alfred Gundersen continued his work on classification of the dicotyledons; Dr. George M. Reed his work on disease-resistant cereals; Dr. H. K. Svenson his investigations on the flora of the Galapagos Islands as compared with that of the western coast of South America; Dr. Arthur H. Graves his breeding work on chestnuts, seeking disease-resistant hybrids; and Dr. Avery with assistants started work on plant hormones.

New York Botanical garden rebuilt its main conservatory during the decade at a cost of \$350,000 and rearranged the collection within it, improved facilities for propagating and growing plants, returned a considerable area to the city of New York for park purposes and fenced in the rest of the garden, developed a plan for increasing the physical facilities of the garden involving a total cost of about \$2,700,000 and developed new laboratories for plant physiology.

It continued the explorations of Dr. Bassett Maguire in British Guiana and Surinam, of E. J. Alexander in Mexico, Dr. W. H. Camp in Ecuador and Otto Degener in the Hawaiian and Fiji Islands, and explorations of other members of the staff in continental U.S. More than 352,000 specimens were added to the herbarium and 7,100 volumes to the library.

The Hemlock arboretum at "Far Country," Germantown, Philadelphia, Pa., increased its accession number to 211, representing in all 9 species of Tsuga and 40 variations of these species. There were at least 25 easily identifiable varieties of T. canadensis, 5 of T. caroliniana and 4 of T. Mertensiana. The Morton arboretum, Lisle, Ill., erected the Thornhill building which housed the library, lecture hall, class rooms and laboratories. Aside from developing the arboretum, great emphasis was put on an educational program for children and adults. On its 948acre tract, the University of Wisconsin Arboretum and Wildlife refuge added many thousands of trees to both the Tamarack and White Cedar associations, studied plant associations in upland and lowland prairies, initiated an extensive study of songbird nesting, established a wood duck colony, studied the effect of crowding of mixed fish populations in ponds, and increased the planting of wild flowers on the wild flower trail.

Projected Gardens.—Some new gardens and arboretums were projected for the postwar future. The Soviet Academy of Sciences planned a new botanical garden of 650 acres at Moscow with Nikolai Tsitsin, the originator of perennial wheat, as director. It was to consist of large conservatories, laboratories, halls and ornamental plantings. The John J. Tyler arboretum, Lima, Pa., was planned under the directorship of John C. Wister; and Houston, Texas, was considering the organization of an arboretum. Robert Allerton made a gift of "The Farms" (6,000 ac.), Monticello, Ill., to the University of Illinois. Robert Allerton Park and the residence with the valuable art collection would provide for a co-ordinated research program in forestry, entomology, zoology, biology, and in fine and applied arts blending architecture and landscape architecture.

One hundred acres were set aside for 4-H clubs and related educational programs. Much of the rich land was to be continued as grain and stock farms to support the educational and research programs. (See also BOTANY; HORTICULTURE.)

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Botany

The period immediately preceding World War II was one of unprecedented progress in the utilization of plants for practical ends and for the solution of fundamental biological problems. Botanical activity was centred not only in English and German speaking countries, but also in many other parts of the world. The Scandinavian countries, and especially Sweden, constituted a very important centre. The U.S.S.R. and Japan were extremely active. Botanical research made rapid progress in India, China and Latin America. An extensive program of investigation was maintained in The Netherlands, and the Netherlands Indies. All parts of the world witnessed a significant expansion of botanical investigation.

In nature and scope, these activities covered a great variety of theoretical and applied fields, ranging from plant exploration and classification to fundamental researches on the nature of living matter. An interesting and important trend during 1937-46 was an increased emphasis upon the experimental as opposed to the purely descriptive approach in the older fields of botany, a tendency particularly noticeable in the hitherto primarily descriptive fields of taxonomy and morphology. Taxonomy rapidly shifted from the collection and cataloguing of plants to an attack upon the problems of evolutionary development and relationship, of the nature and origin of species, of the factors maintaining species or bringing about their modification. In order to study plant populations as dynamic developing assemblages, the taxonomist had to use the techniques of genetics, cytology, ecology and other fields of botany. One may cite for example, the extensive work of E. B. Babcock and G. Ledyard Stebbins, Ir., on the hawkweed, Crepis, in which analysis of alterations in chromosome number and structure provided an important clue to the evolutionary development of the genus, and to an understanding of the nature and relationship of its various species. Another approach was seen in the extensive transplantation studies begun by H. M. Hall and carried on by Jens Clausen, David D. Keck, and W. McK. Hiesey. By growing plants of the same genetic constitution under very diverse climatic and cultural conditions, they analyzed successfully the roles of heredity and environment in moulding the individual and in modifying the race. Other cases where the experimental approach proved effective included the work of Edgar Anderson on Iris and Tradescantia, of A. F. Blakeslee and colleagues on Datura, and many others.

In the field of morphology, experimental methods assumed increasing importance during the decade. For example, scholars had long argued over the constitution of the growing tips of roots and stems and the manner in which the various tissues of the mature plant are differentiated from these. New light was shed on these questions by the use of such diverse agents as colchicine and X-rays. Sophia Satina and Blakeslee, using colchicine, brought about doubling of the chromosome numbers in certain cells of the growing stem tip. Since it was possible to recognize cells having doubled chromosome numbers under the microscope, it was also possible to trace the cells which had descended from the originally altered cell and thus to determine the positions in the growing point of the cells from which the various regions of root or stem are derived. Robert T. Brumfield used X-rays to the same end, inducing alterations in chromosome structure in individual cells of the growing tip, and tracing the cells and tissues into which the altered chromosomes had been transmitted.



Rare plants, unknown to modern British botany, were discovered in the bomb craters and ruins of London after the peak of German air raids had passed. Here a botanist is examining a new flower which sprang up in a crater enriched with the nitrate of a bomb

Many other noteworthy discoveries and advances were made during the decade in the field of botany. It will be possible to mention only a few of them.

Reference has been made above to the use of colchicine in developmental studies. The possibility of the use of colchicine in plant studies was first suggested by O. J. Eigsti in 1937 and the first results of its use were announced the same year by A. F. Blakeslee and George S. Avery, Jr. Colchicine, a drug from the autumn crocus, destroys the mechanism by which chromosome halves are separated into the daughter cells in cell division, so that the products of chromosome splitting remain together. As a result, cells are produced with a doubled number of chromosomes. From these, plants with doubled chromosome numbers can be obtained. Such plants are often of enormous value in genetical and other theoretical studies. They are also of great practical value inasmuch as they often possess desirable new characteristics. The use of colchicine has become standard practice in certain types of plant breeding experiments, notably in the case of inconstant or sterile, but otherwise desirable hybrids, which become both constant and fertile when the chromosome number is doubled.

Noteworthy progress was made in the technique and utilization of tissue cultures in plants. The early work of G. Haberlandt, W. Kotte, William J. Robbins, Lewis Knudson and others led to the first successful prolonged cultivation of plant tissues by Philip R. White in 1937. Success was first achieved with root tips, but it was later found possible to grow stem tips indefinitely in artificial culture (Shih-Wei Loo, 1945). A later advance was made in the excision of young embryos from seeds and their cultivation in synthetic medium. I. Van Overbeek, H. B. Tukey, Hempstead Castle, L. F. Randolph, A. F. Blakeslee, and others succeeded in growing the excised embryos of a considerable variety of plants, bringing them through to successful maturity. The cultivation of plant tissues made possible the study of many aspects of plant nutrition which had hitherto been beyond the reach of the experimentalist. As a result, the decade witnessed unprecedented gains in botanists' understanding of the role of various chemical elements, of vitamins, etc., in the economy of the plant. Tissue cultures also made possible fundamental discoveries in the fields of respiration and of enzyme action in general. Embryo cultures increased understanding of the physiology of the early stages of development. They also made it possible to shorten the developmental period in many cases. Iris embryos, which ordinarily have a long dormant period, were made to develop immediately if excised from the seed before the period of dormancy commences (L. F. Randolph, 1945). Peach and apricot embryos were excised and the plants thus produced brought to flowering within two years, thus enormously shortening the time required for breeding work (Walter E. Lammerts, 1942). Embryo culture also made it possible to obtain hybrids which would not otherwise have been obtainable. Thus, in Datura and Oenothera, embryos derived from wide crosses frequently become arrested and fail to develop, but if they are excised before they become arrested, they can often be brought through to maturity. In this way, the range of genetical experimentation was greatly extended.

Another new and promising field of botany was the use of radioactive isotopes for the study of certain physiological problems. The course which these radio-active substances take through the plant was traced by the use of radiological equipment, and it became possible not only to study in detail the paths by which materials are transported, but also to follow the sequence of chemical transformation through which they pass and thus to trace the story of metabolism of the plant. To cite but one example, the chemical transformations involved in the process of photosynthesis were partially elucidated by these means (S. Ruben, W. Z. Hassid and M. D. Kamen, 1940). It was found that the initial step in the assimilation of CO₂ is a dark process independent of light. This is followed by the light reaction or photochemical step. Since photosynthesis is undoubtedly the most important chemical transformation occurring in nature so far as life is concerned, the analysis of this process became of fundamental importance. The use of both radioactive and stable isotopes as tools in the study of metabolic processes opened a new and exceedingly promising field.

One of the most striking developments of the decade was the widening utilization of the fungi for scientific and practical purposes. Various fungi were found to be well adapted to the study of many fundamental biological problems. Yeast, for instance, was used for fundamental studies on respiration and the action of enzyme systems,

on problems of inheritance, and on the relation of cytoplasmic to genic factors in the control of heredity. Neurospora yielded data of first importance in regard to the manner in which genes produce their effects (George W. Beadle and collaborators). Knowledge of the physiological basis of sexual union was greatly extended by discovery in Achlya of the hormones responsible for the production of reproductive organs and cells and the union of gametes (John R. Raper, 1939). The brilliant work of E. C. Stakeman, John W. Keitt and others on reproduction, inheritance and mutation in the smuts and rusts was of great theoretical as well as practical importance.

From the practical point of view, fungi took on increased importance as the chief source of certain vitamins such as riboflavin, of antibiotics such as penicillin and streptomycin, of chemical reagents such as acetone, butyl alcohol, ethyl alcohol; as material for the bio-assay of vitamins, hormones, etc. The growing importance of the lower organisms, including the bacteria and fungi, both for fundamental and applied purposes was attested by the growing use of the term "microbiology," which rapidly became a recognized and distinct field. The Botanical Society of America at its meeting in March 1946, organized a new Section of Microbiology to further work in this field.

Conversion for War Purposes.—With the onset of the war the accelerated research activity in botany was rapidly converted into practical contributions toward the war effort. Many botanists became involved in exploratory expeditions, searching for new sources of quinine and other medicinals, of insecticides, rubber plants, food products, oils, etc. The U.S.S.R. and the U.S. were particularly active in this regard. Extensive research projects were inaugurated for the improvement of rubber-producing plants, the most important of which proved to be the Russian dandelion (Taraxacum kok-saghyz), guayule (Parthenium argentatum) and Cryptostegia. The field of antibiotics became one of outstanding importance with the discovery of penicillin, produced by strains of the common blue mould, Penicillium. Intensive efforts to improve the original strain of Penicillium, to discover new and better strains, and to improve by cultural and manufacturing techniques the quantity and quality of the product occupied the attention of many botanists in various countries. The search for other antibiotics and for fungi or other micro-organisms which would yield increased amounts of important chemicals was carried on intensively and successfully. Extensive studies were made of the fungi causing deterioration of fabrics and other materials, and of fungi causing human disease. Increased attention was given to the control of diseases affecting plants of economic importance. The war years, therefore, witnessed the transferral of emphasis from basic and fundamental aspects of botany to practical attempts to place plants and plant products at the service of the war effort. Much of the work done during the war was confidential in character; consequently, the volume of published research in botany tended to dwindle during this period.

During the war the regular scientific meetings of the botanical societies were largely suspended. The Botanical Society of America held one meeting in Cleveland, Ohio, in Sept. 1944, but other wartime meetings were cancelled. The Seventh International Botanical Congress, which was to have been held in Sweden in 1940, was cancelled.

New Laboratories.—Several important new laboratories for the study of botanical problems were established

during the decade. In 1941 the new U.S. plant, soil and nutrition laboratory of the U.S. department of agriculture was established at Cornell university, Ithaca, N.Y., for the purpose of discovering ways of increasing the nutritional value of foodstuffs through studies of soil and crop management, soil types, and plant and animal nutrition. During 1940 and 1941 four huge new regional research laboratories of the U.S. department of agriculture were occupied. These laboratories, situated in Peoria, Ill., Philadelphia, Pa., New Orleans, La., and Albany, Calif., were designed to develop new uses and new outlets for farm commodities. They were important centres of research during the war period.

The story of botanical research during the decade was, in general, one of great expansion and notable discovery during the first portion, and of intense wartime activity during the war period. With the cessation of the war a period of renewed interest in fundamental problems began. (See also Biology; Botanical Gardens; Chemistry; Chemurgy; Genetics; Horticulture; Marine Biology.)

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Bougainville

See SOLOMON ISLANDS.

Boulder Dam

See Aqueducts; Dams; Public Utilities; Water Power.

Bowles, Chester

Bowles (1901-), U.S. advertising executive and government official, was born April 5, 1901, in Springfield, Mass. He was graduated from Yale university in 1924. In 1929, with William Benton, he formed the advertising firm of Benton & Bowles, later one of the most successful companies in its field. In Dec. 1941, Bowles took a leave of absence to work on a dollar-a-year job with the Office of Price Administration, later becoming OPA administrator for Connecticut. In July 1943, Prentiss M. Brown, then OPA national director, named Bowles as general manager of his agency. Bowles succeeded Brown Oct. 25, 1943, and throughout 1944 and 1945 battled vigorously to maintain price controls. On Dec. 5, 1945, he denounced "the small minority of business pressure groups" which he said were trying to abolish price controls and predicted inflation "followed by a shattering smashup" if controls were not maintained and extended to 1947.

On Feb. 14, 1946, President Truman established the Office of Economic Stabilization and named Bowles as head of the new agency. During 1946 he fought some demands for price markups, agreed to others and presented a "blueprint" of President Truman's "bulge-in-the-line" wage-price policy which, according to Bowles' prediction,

would open the gates for "the greatest flood of goods this great nation has ever seen." Subsequently he attacked what he called "crippling" amendments to the price control structure, and appealed to congress for adequate funds to fight the black market. After the senate, on June 28, 1946, passed a bill extending the OPA but weakening its price controls, Bowles resigned as director of economic stabilization with the warning that price control under the measure would be "flatly impossible" and urged the president to veto it. Truman did veto the measure the following day; Bowles praised the president for his "courage" in taking action against the "monstrous" and impossible price control bill. Later Bowles unsuccessfully sought the Democratic nomination for governor of Connecticut.

Bowling

Of all popular U.S. sports, bowling probably had the greatest increase in participants and playing facilities from 1937 to 1946. While other sports generally lost ground during World War II, bowling increased in popularity. The adaptability of the game, played by young and old, men and women, led to a steady rise in participants, to an estimated 12,000,000 bowling more or less regularly at the end of the decade.

The American Bowling congress, legislative organization of the sport, was established in 1895 with 60 teams. In 1935, team membership in the A.B.C. reached 41,000; thereafter it grew steadily until the official count during 1946 was set at 183,000 teams. Entries of more than 2,000 bowlers were not uncommon in city and state tournaments, with Detroit, Mich., holding the record at 3,434 for its 1945 city championship.

Biggest bowling event each year continued to be the American Bowling congress championships, which attracted 25,567 bowlers to the 1946 tournament at Buffalo. The 1938 A.B.C. drew 17,441 entries. A record of \$254,704 was distributed as prize money in the 1942 tournament at Columbus, O., during 72 days of pin-smashing.

In the 43-year history of the A.B.C. tournament, a total of \$3,163,914 had been distributed in prize money. The 43 tournaments attracted 284,227 bowlers. Aside from the official championships, the A.B.C. continued to give gold awards for high scores rolled during the calendar year. It also presented gold, silver and bronze medals to those rolling 300, 299, and 298 games in sanctioned competition. As of Aug. 1, 1946, 3,219 gold medals had been awarded to those who bowled perfect 300's. Hank Marino of Milwaukee led the list with 10, followed by Walter Ward of Cleveland, 7; Sam Garofalo of St. Louis, June McMahon of Lodi, N.J., and Hal Schaeffer of St. Louis, six each.

Like many another sport, bowling took a three-year tournament recess during the war years. In lieu of the annual A.B.C. tournament, a series of match game championships unofficially settled the titles for the war years of 1943, 1944 and 1945.

The decade 1937-46 marked a tremendous development in bowling facilities. Twenty-four and 48 alleys, side by side, were not uncommon in the larger cities, and in 1945 experiments on automatic pin-setters were being made. Universal increases in wages forced proprietors to meet the high price of pin boys, and per-line costs to the bowlers were almost doubled over the ten-year period.

A.B.C. Results.—The American Bowling congress attracted 22,000 competitive bowlers to New York in 1937. Eugene Gagliardi of Mt. Vernon, N.Y. won the singles

title with 749, a mark which was unsurpassed in individual competition until 1942. The all-events crown went to Max Stein of Belleville, Ill., with 2,070. Virgil Gibbs and Nelson Burton, Dallas, Tex., won the doubles with 1,359, while Detroit's Krakow Furniture company took the five-man team championship with 3,118.

In 1938, the 38th annual A.B.C. attracted 24,785 entries to Chicago, with Knute Anderson of Moline, Ill., winning the individual crown with 746. The Chicago team of Birk Brothers Brewing company continued the switching of the five-man title from Detroit to Chicago and back with 3,234 points. Don Johnson and Fonnie Snyder of Indianapolis, Ind., captured the doubles with 1,337.

Twenty-three thousand bowlers took part in the 1939 A.B.C. at Cleveland, with Jim Danek of Forest Park, Ill., taking the single event with 730. The team title returned to Detroit on the 3,151 posted by the Fife Electric Supply company total, while Murray Fowler and Phil Icuss of Steubenville, O., won the doubles with 1,405.

The championship of 1940, which drew an entry of 30,000 bowlers from 731 cities to Detroit, marked the first time in A.B.C. history that two 300 games had been rolled. Two Ohioans, George Pallage of Akron and Angelo Domenico of Canton, rolled perfect games, although neither wound up as champion. The A.B.C. titlists were: Ray Brown of Terre Haute, Ind., singles, 742; Herbert Freitag and Joe Sinke of Chicago, doubles, 1,346, and Fred Fischer of Buffalo, N.Y., all-events, 2,001.

In 1941, the A.B.C. was noteworthy for its numerous fine performances, as well as a record attendance of 150,000 attracted to the St. Paul, Minn., scenes of the championship. William Haar of Chicago scored a perfect 300 in the doubles, and William Caskey of Canton, O., recorded a 299. Fred Ruff of Belleville, Ill., won the singles with 745, outscoring a field in which 25 entries rolled 700 or better. Ray Farness of Madison, Wis., recorded a 767, highest score of the 1941 tournament and fifth highest in the classic's history, to team with William Lee as doubles winners with 1,346. The Vogel Brothers team of Forest Park, Ill., won the five-man event, while Harry Kelly of South Bend, Ind., captured the all-events with 2,013.

John Stanley, rolling a near-record 756, won the A.B.C. singles crown at Columbus, O. in 1942. A total of 23,773 individuals bowled for the \$254,704 in prize money. An aggregate of 228,537 games were bowled through the 1942 tournament. In winning the singles crown, Stanley had games of 258, 252 and 245, and his total was second highest in the history of the tournament. Stanley Moskal of Saginaw, Mich., won the all-events with 1,973.

With the A.B.C. canceled in 1943, competitive bowling turned to the National Individual Match Game championship for its titlist. Ned Day of West Allis, Wis., after being voted "Bowler of the Year" by the Bowling Writers' association, won the match game singles title with a 64-game average of 208-plus. Others to finish were: Paul Krumske of Chicago, second; Rudy Pugel of Milwaukee, third; Herbert Bomar of Chicago, fourth, and John Crimmins of Detroit, fifth. Outstanding score among A.B.C. members in 1943 was the 824 rolled by Louis Foxie of Patterson, N.J.

Herbert "Buddy" Bomar of Chicago topped the individual accomplishments of 1944 bowling by winning the National Individual Match game title and teaming with William Flesch, also of Chicago, for the doubles crown. Bomar bested a field of 125 leading U.S. bowlers in a 64-game tournament at Chicago, averaging better than 205 pins. Pvt. Joe Wilman, from Fort Lewis, Wash., by way of Berwyn, Ill., was second, with Ned Day third. The Stroh Bohemians of Detroit retained their team match game championship with victories over challengers from Philadelphia and Detroit.

Pvt. Wilman moved from second to first among the National Individual Match Game bowlers in 1945, toppling 13,437 pins in 64 games for a 210 average. Next in line were: Pvt. Thurman Gibson of Detroit, second; Andy Varipapa of Hempstead, L.I., third; Walter Ward, Cleveland, O., fourth, and Ned Day, West Allis, Wis., fifth. William Kenet and Walter Reppenhagen of Detroit won the doubles title, while the E. and B. team of Detroit ended a four-year reign of Stroh Bohemians, also of Detroit, as team champion.

After a three-year recess because of the war, championship bowling returned to the annual A.B.C. during 1946. Leo Rollick of Santa Monica, Calif., and formerly of Chi-

Tournament records which still held at the end of 1946 for the 43 annual A.B.C. championships (1901 to 1946)

	Year	Record
High Team total Birk Bros., Chicago, Ill	1938	3,234 pins
High Team game Tea Shops, Milwaukee, Wis	1927	1.186 pins
High Doubles total	1933	1,415 pins
High Doubles game John Gworek-Henry Kmidowski, Buffalo, N. Y	1946	544 pins
High Singles total Larry Shotwell, Covington, Ky	1930	774 pins
High All Events total	193 <i>7</i>	2,070 pins
Highest Lifetime total	901-46	70,245 pins
Team all events	1941	9,254 pins
Winner of most A.B.C. titles John Koster, Nyack, N.Y		4 titles
Most A. E. totals above 1,900 Herb Lange, Libertyville, Ill		5
Most 1,800's in a row Joe Bodis, Cleveland, Ohio	1925-32	8 in row
Best 3 garnes in 1 tournament	1946	(300-279-265) = 844
Most strikes in 1 tournament Max Stein, Belleville, Ill	193 7	68 strikes
Most strikes in 1 event Larry Shotwell, Covington, Ky. (Singles)	1930	30 strikes
Highest prizewinner in 1 tournament Leo Rollick, Santa Monica, Calif	1946	\$945.

Champions of the American Bowling congress annual tournaments from 1937 to 1946

Champions of the American Bowling congress annual tournaments from 1937 to 1946											
Team Event	Score Singles Event Score										
1946—Llo-Da-Mar, Santa Monica, Calif. 1942—Budweiser Beer, Chicago, III. 1941—Vogel Bros., Forest Park, III. 1940—Monarch Beer, Chicago, III. 1939—Fife Electric Supply Co., Detroit, Mich. 1938—Birk Brothers, Chicago, III.	3,023 Leo Rollick, Santa Monica, Calıf. 737 3,131 John Stanley, Cleveland, Ohio 756 3,065 Fred Ruff, Jr., Belleville, Ill. 745 3,047 Ray Brown, Terre Haute, Ind. 742 3,151 James Danek, Forest Park, Ill. 730 3,234 Knute Anderson, Moline, Ill. 746										
Two-Man Event	All Events										
1946—John Gworek—Henry Kmidowski, Buffalo, N.Y. 1942—Ed Nowicki—George Baler, Milwaukee, Wis. 1941—William Lee—Ray Farness, Madison, Wis. 1940—Herbert Freitag—Joe Sinke, Chicago, III. 1939—Philip Icuss—Murray Fowler, Steubenville, Ohio 1938—Don Johnson—Fonnie Snyder, Indianapolis, Ind. 1937—Virgil Gibbs (Kansas City, Mo.)—Nelson Burton (Dallas, Texas)	1,377 Stanley Moskal, Soginaw, Mich. 1,973 1,346 Harold Kelly, South Bend, Ind. 2013 1,346 Fred Fischer, Buffalo, N.Y. 2,001 1,405 Joe Wilman, Berwyn, Ill. 2,028 1,337 Don Beatty Indeed Mich. 1,078										

High 5-Man Team Total Winners

Year Team and Town 1938—Giumbetti Coal Co., Carbondale, Pa	3,602 1942—Faber Cement Block, Teaneck, N.J	,547 ,553										
High 5-	i-Man Team Game Winners											
1938—Standard Tru-Age, Wilkes-Barre, Pa	1,286 1942—Faber Cement Block, Teaneck, N.J. 1,300 1,300 1943—Marcal Products, Paterson, N.J. 1,287 1,287 1944—Hansen Jewelers, Maywood, Calif. 1,1	,285 ,262										
High Individual 3-Game Winners												
1938—Russell Peters, Carbondale, Pa. 1939—Albert Brandt, Lockport, N.Y. 1940—Peter Kisloski, Wilkes-Barre, Pa. 1941—John Fela, Wilkes-Barre, Pa. 1941—William Miller, West New York, N.J. *Duplicate award because of ties.	841 1942—Russell Gersonde, Milwaukee, Wis	*822 *822 824 832 824										
All-Time Record Scores in Annual Award Competition												
Event Team and City	Year S	Score										
High team game —Hermann Undertakers, St. Louis, Mo. High Indiv., total —Albert Brandt, Lockport, N.Y. High doubles —Charles Lausche—Frank Franz, Cleveland, Ohio		,797 ,325 886 ,494 ,257										

cago set a tournament record for prize winnings with a total of \$945. He won the singles with 737; placed second in the all-events, and was a member of the team champion—the Llo-Da-Mar entry of Santa Monica. Joe Wilman won the all-events with 2,054, thereby becoming the eighth bowler in history to win three championships. Henry Kmidowski and John Gworek of Buffalo, won the doubles title. (M. P. W.)

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Boxing

Two figures stood out in boxing during the ten-year span 1937–46. Their careers were intertwined. They were Joseph Louis Barrow, the Joe Louis who came off a share-cropper's land in Alabama to win the world heavyweight championship title, and Michael Strauss Jacobs, who progressed from the not unexciting estate of theatre-ticket speculator to the position of the world's leading boxing promoter.

Louis won the world heavyweight championship by knocking out James J. Braddock in eight rounds at Chicago, June 22, 1937. In ten years he defended the title more often than any other title-holder, irrespective of division, in modern or ancient ring history. He upset precedent upon winning the championship by agreeing to defend it immediately. This he did, within three months, in a 15-round bout against Tommy Farr, who, in 1937, was England's champion. Louis followed this precedent in the years that followed, up to and including the two title defenses he made in 1946, knocking out Billy Conn in eight rounds and Tami Mauriello in 2 min. 9 sec.

In respect to title defenses, Louis stood forth as the greatest heavyweight champion boxing had ever known. Whether he was the greatest from the standpoint of ability could not be measured by any yardstick. There were two schools of thought on the comparative appraisal of Louis and Jack Dempsey. The fact was undeniable, however, that Louis' championship reign already exceeded the Dempsey term from 1919 to 1926, that Louis, of his own volition, had made more title defenses, and that Louis had knocked out every man he faced for the title with the exception of Farr, his first challenger, and Arturo Godoy, Chile, ninth in line, over whom he won decisions.

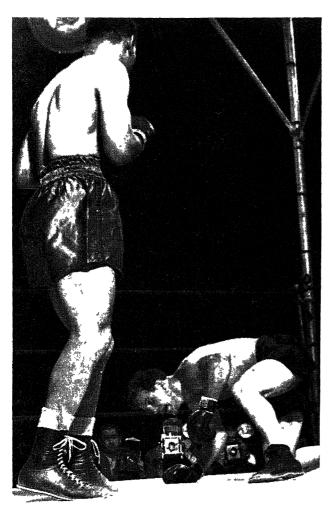
Jacobs' advance was in stride with Louis' activities and gradually underwent expansion until, as president and promoter of the Twentieth Century Sporting club, New York, he established himself as the leading boxing promoter of the world; beyond question the most successful promoter in all boxing history. It was recognized that he even surpassed the legendary George Lewis (Tex) Rickard, whose promotional daring Jacobs shared and to whose position in boxing he succeeded.

Jacobs broke the monopoly of Madison Square Garden, New York, on heavyweight title bouts, and Louis was the instrument of his success in this situation as well as in boxing generally. Braddock, under contract to Madison Square Garden after having succeeded Max Baer as champion in 1935, was scheduled to defend the title against Max Schmeling. of Germany, a former champion, in 1937, but withdrew from this bout and elected instead to defend against Louis. Jacobs had Louis under exclusive contract. When Louis knocked out Braddock, Jacobs gained exclusive rights to heavyweight title defenses and promoted championship matches in the various large boxing centres of the country, such as Chicago, Detroit, St. Louis, Boston, Los Angeles, Philadelphia and Washington.

In all, Louis made 23 defenses of the title during 1937–46, all of them under Jacobs' promotion by an arrangement mutually advantageous. Louis' ring earnings under Jacobs' aegis were conservatively estimated at more than \$3,000,000. No figures were available on Jacobs' earnings through Louis' championship bouts or the many others he conducted in the various divisions of boxing. It was of record Jacobs had never had a losing venture in boxing.

Louis stood out pre-eminently in a decade which saw four years of war cast its blight on boxing. The sport continued through the war, despite the absence of all eligible ring champions who entered service. The action on the home front was necessarily of a comparatively mediocre calibre, conducted with official sanction for purposes of morale. Boxing, too, was a conspicuous part of army and navy training programs, and its influence as a competitive outlet for emotions and as a spectator sport in home camps as well as behind the actual battle lines was recognized and lauded by officers in all branches of service.

Louis and Conn were among prominent boxers who entered service. More than 300 others were in the army, the navy, the marine corps, the coast guard or the merchant



Joe Louis waiting for Billy Conn to rise from the canvas during the fourth of an eight-round fight at Yankee stadium, N.Y., on June 19, 1946. Louis won by a knockout in his 22nd title defense bout

marine. Barney Ross, whose reign as world welterweight champion ended in 1938, emerged from the war with high military honours earned as a marine at Guadalcanal. He was but one of many boxers who distinguished themselves in actual combat.

Rivaling Louis in prominence within the 1937-46 period was Henry Armstrong, Los Angeles, Calif. He distinguished himself as the only boxer in all ring history to hold three championships at one time. He first won the featherweight title in 1937. The following year he won both the welterweight championship and lightweight championship titles, in that order. This created a situation unparalleled. The consequence was confusion almost beyond description. It being not only boxing tradition but established custom that a champion should risk his title whenever a challenger entered the ring at or below the prescribed weight for the class involved, the question developed over championship succession in the event Armstrong, risking his featherweight title, was beaten by a challenger. Obviously, with a challenger at the prescribed 126 pounds for the featherweight class, the division maximum, he would also be "at or under" the 135-lb. maximum for the lightweight division, as well as for the welterweight division (147 lb.). Logically, a successful challenger would have a valid claim on all three titles in the event of victory (see below).

To solve the problem, Armstrong resigned his featherweight title in 1938. He lost his lightweight title in 1939. He went into eclipse as a competitor after losing his welterweight title in 1940. Regulating bodies in boxing throughout the United States, to avoid duplication of such a confusing situation in the future, adopted restraining legislation, depriving a champion of the privilege of competing for a title in the next higher class or classes, without first relinquishing all claim to the other championship.

From time to time, however, confusion surrounded some of the other boxing championships. This grew out of rivalries among regulating bodies. Where a champion resigned his title or retired, one governing body would approve what it considered a satisfactory match among outstanding title contenders for the express purpose of establishing a class leader, only to have another administrative faction dissent. Such confusion, however, never attached to Louis' heavyweight championship.

Louis' Amazing Record.—Louis three times shared the distinction of defending his title before a \$1,000,000 crowd. He also fought before the crowd which paid the highest sum ever to see a ring title event, on boxoffice standards. More, he was a principal in the fight which drew the second largest gate receipts of ring history. This was the bout held June 19, 1946, when he fought Conn for the second time. Louis knocked out Conn in eight rounds of a struggle that was disappointing because Conn was tremendously over-matched. He had come back from war's, duties shorn of much of his ring ability, unlike Louis, who, for all practical purposes, was sharp, well-conditioned, punching as hard and as accurately as of yore. Following his knockout, Conn announced his retirement from boxing.

A crowd of 45,266 persons saw this battle, paying as high as \$100 a ticket for ringside and other desirable seats in Yankee stadium, New York city. The receipts amounted to \$1,925,564, a figure second only to the history-making 'gate" of \$2,658,660 at the second meeting between Jack Dempsey and Gene Tunney in Chicago in 1927. For knocking out Conn in eight rounds, Louis received in excess of \$600,000. Conn's purse exceeded \$300,000. In each instance it was the largest purse the boxer ever collected.

Louis had knocked out Conn in 13 rounds of a battle held at the Polo Grounds June 18, 1941, when 60,071 persons paid receipts of \$451,743 to see the spectacle before the two went off to war. In this bout Conn thrilled the crowd by staggering Louis with a right hand punch to the jaw late in the 12th round. This picture lived in the memories of onlookers and with those who read of or heard the bout broadcast. Their postwar meeting, therefore, was eagerly awaited. The consequence found promoter Jacobs swamped with applications for choice seats immediately after he announced the signing of the return match. In a few weeks Jacobs had applications from 38 states and others from foreign countries, enclosing signed checks with instructions for the promoter to fill in the amount for the tickets sought. At the time Jacobs had not adopted a price schedule. Newspapers speculated, however, on the \$100 charge and it was with this possibility in mind that the applications were forwarded. Jacobs, therefore, decided upon this price.

Louis' other \$1,000,000 gates came when he knocked out Max Baer in four rounds in 1935 and Max Schmeling in one round in 1938. The Baer bout attracted receipts of \$1,000,832 and the Schmeling match \$1,015,012.

Until the advent of Louis, it had been more or less the custom for a heavyweight champion to confine his activities to one bout a year, if he fought that often. Louis shattered this precedent, however, when, following his triumph over Braddock in 1937, he came back to the ring in September of that year to win a 15-round decision over Tommy Farr in New York. In 1938 he made three title defenses, knocking out, successively, Nathan Mann in three rounds in New York, Harry Thomas in five rounds in Chicago, and Schmeling, in the bout that drew a gate of \$1,015,012, in New York.

Through 1939, Louis defended his title four times. He knocked out John Henry Lewis in one round in New York, Jack Roper in one round in Los Angeles, Calif., Tony Galento in 4 rounds in New York and Bob Pastor in 11 rounds in Detroit. Four more title defenses came in 1940, starting with a 15-round decision Louis won over Arturo Godoy in New York. This was followed by a two-round knockout over Johnny Paycheck in New York, a knockout in eight rounds over Godoy in New York and a six-round knockout over Al McCoy in Boston.

Louis had his busiest year in 1941. He defended the heavyweight title seven times, knocking out as many rivals. He started the year with a five-round knockout over Clarence (Red) Burman, in New York, followed this with a two-round knockout over Gus Dorazio in Philadelphia and knocked out Abe Simon in 13 rounds in Detroit. A month later he knocked out Tony Musto in nine rounds in St. Louis, and followed this with a seven-round victory over Buddy Baer in Washington, D.C.; Baer was disqualified after being rendered helpless. This was followed by the 13-round knockout of Conn; in an exhibition bout a month later Louis knocked out Jim Robinson in Minneapolis. Lou Nova was Louis' seventh legitimate challenger, and Louis knocked him out in six rounds in New York.

On Jan. 9, 1942, Louis knocked out Buddy Baer in one round of a bout in Madison Square Garden, New York, donating his entire purse to the Naval Relief fund. On March 27, Louis knocked out Abe Simon in six rounds in Madison Square Garden, donating his entire purse to the Army Relief fund. That was his last fight before joining the army.

Titles in Dispute.—The light-heavyweight championship title was in dispute from 1935 until 1939 following the surrender of the title by John Henry Lewis to enter the heavyweight class. Billy Conn succeeded to the championship Sept. 25, 1939, when he won a 15-round decision over Melio Bettina in Madison Square Garden. Conn, however, resigned the title to enter the heavyweight class June 4, 1941, a procedure upon which the New York State Athletic commission insisted before agreeing to sanction a heavyweight title bout between Conn and Louis. Anton Christoforidis and Melio Bettina fought in Cleveland, O., June 12, 1941, and when Christoforidis received the decision after 15 rounds he was recognized by the National Boxing association as champion. However, universal recognition to a titleholder did not develop until later that year, when Gus Lesnevich won a 15-round decision over Christoforidis in Madison Square Garden.

Lesnevich defended the title against Tami Mauriello Aug. 26, 1941, and won a 15-round decision. Lesnevich shortly afterward entered the service. He did not again defend the title until May 14, 1946, when, following his discharge, he knocked out Freddie Mills, British champion, in ten rounds at London. A crowd of 12,000 saw this first postwar invasion of England by a U.S. fighter. The receipts amounted to \$176,000, creating a record for Great Britain.

The absence of a working agreement between the National Boxing association and the New York State Athletic commission resulted in confusion attending possession of the world middleweight title through most of the 1937–46 span. The situation was not clarified until Nov. 28, 1941,

when Tony Zale fought his way to universal recognition as title-holder, two months before he enlisted in the navy, where he served through the war. Confusion involving the title dated back to the retirement of Mickey Walker from the class in 1931. It developed into the most involved situation to affect any ring division. Fred Apostoli defeated Marcel Thil, French boxer who entered the picture with a title claim, on Sept. 23, 1937, in a ten-round bout in New York. However, because of an "agreement" effected prior to the bout, Apostoli made no claim for championship recognition. Apostoli, Babe Risko and Freddy Steele entered claims for the title and separately received recognition in different sections of the country. However, it was not until July 26, 1938, when Al Hostak knocked out Steele in one round of a bout in Seattle, Wash., that the way was paved for a solution to the problem. This victory brought Hostak the recognition of the National Boxing association, since Steele had entered the bout as the recognized N.B.A. champion. On Nov. 1, Solly Krieger won a 15-round decision over Hostak in Seattle, Wash., and on June 27, 1939, Hostak regained the N.B.A. title distinction when he knocked out Krieger in four rounds of a return bout at Seattle. On Jan. 29, 1940, Zale won a ten-round decision over Hostak in Chicago, to become the N.B.A. champion.

Meanwhile, the New York State Athletic commission held aloof from these "championship" matches. The regulating body based its indifference upon Steele's refusal to give Apostoli a chance at the title in 1938, following a knockout victory Apostoli scored in nine rounds over Steele on Jan. 7, 1938, in a bout held in New York in which the title was not involved because, by arrangement, Apostoli weighed in excess of the 160-pound class maximum. The New York commission granted Apostoli recognition as title-holder. Apostoli lost this recognition when he was knocked out in seven rounds of a bout in Madison Square Garden by Ceferino Garcia on Oct. 2, 1939. Ken Overlin defeated Garcia on decision in 15 rounds in New York city, May 24, 1940, succeeding to Garcia's distinction as the recognized champion of New York's State Athletic commission. On May 9, 1941, Billy Soose defeated Overlin on decision in 15 rounds in New York, but surrendered his New York title claim that year, because he could no longer fight at or under 160 pounds. A match then was arranged between Zale and Georgie Abrams, the winner to be recognized universally as champion; on Nov. 28, 1941, Zale won a 15-round decision over Abrams and thus became undisputed champion of the class. He enlisted in the navy without defending the title, although on Feb. 13, 1942, he lost a 15-round decision to Billy Conn in a match at catchweights.

Zale served with distinction through the four years of war and emerged equipped to resume his ring career. He engaged in half a dozen inconsequential matches to accustom himself again to boxing requirements, and on Sept. 27, 1946, knocked out Rocky Graziano in the sixth round of a scheduled 15-round bout in New York city, providing in his first defense of the 160-lb. championship one of the most spectacular and exciting championship matches in the history of the middleweight division.

Armstrong's Three Championships.—Singularly untouched by doubt, confusion or complications of any kind was the welterweight division. In the period of 1937–46, this class saw no less than four transfers of the championship title. Barney Ross was a hold-over title-holder from 1935 as the period began. He led the class until May 31, 1938, when Henry Armstrong defeated him on a deci-

sion in 15 rounds at Long Island City. This was the second championship Armstrong captured in his unprecedented distinction as the only boxer ever to hold three ring championships at one time. He had previously annexed the world featherweight title.

On Aug. 17, 1938, Armstrong won a 15-round decision over Lou Ambers to gain the world lightweight championship and become a triple crown bearer. He vacated his featherweight title that year and the following year lost his world lightweight title back to Ambers in a bout in New York in which it was expressly agreed that Armstrong's welterweight title would not be involved. The necessity of Armstrong's reducing to 135 pounds to make the lightweight class maximum led to this agreement.

Armstrong held the welterweight title for more than two years, through 18 defenses, 14 of which were knockout victories. He defended the title in New York city, Los Angeles, Havana, Cuba; St. Louis, London, Eng.; Des Moines, Minneapolis, Seattle, Denver, Cleveland, Boston, Washington, D.C., and Portland, Me., in the greatest illustration of welterweight championship activity the class had ever known. Not all of his opponents were dangerous challengers. Yet the fact remained that Armstrong placed his title in jeopardy every time he entered a ring with a foeman at 147 lb. or under.

Looking for more worlds to conquer after he had surrendered his world featherweight title in 1938 and following his loss of the world lightweight title in 1939 to Lou Ambers, from whom he had won the honour the previous year, Armstrong, as world welterweight title-holder, made a bid for the world middleweight championship at the time Ceferino Garcia was recognized as champion by the New York State Athletic commission. They fought ten rounds on March 1, 1940, in Los Angeles, and the decision was declared a draw, enabling Garcia to retain his championship rating unquestioned with the New York State Athletic commission.

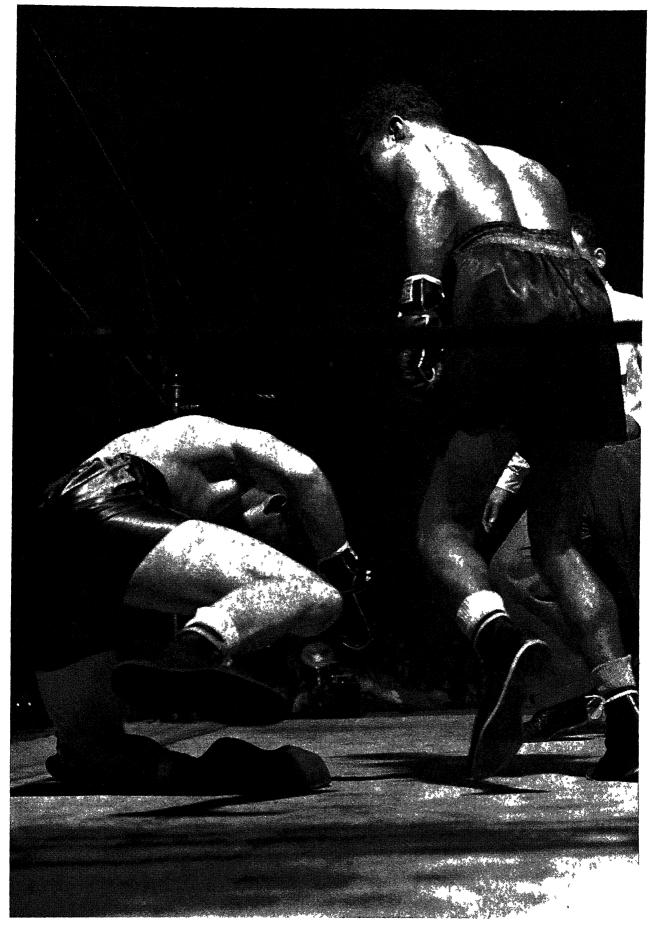
Armstrong had defeated Garcia Nov. 25, 1938, in New York city, in his first defense of the welterweight title after winning the honour from Ross. They fought 15 rounds, and Armstrong won the decision. Others against whom Armstrong defended his title were Baby Arizmendi, over whom Armstrong won a ten-round decision in Los Angeles, Calif., Jan. 10, 1939. This bout launched the most active year of Armstrong's amazing career. He followed the Garcia championship bout with no fewer than ten other bouts. Within the month of October alone he fought five times in as many different cities. Following the January bout, Armstrong knocked out Bobby Pacho in four rounds at Havana, Cuba, March 4; knocked out Lew Feldman in one round at St. Louis, March 16; knocked out Davey Day in 12 rounds at New York city, March 31; won a 15-round decision over Ernie Roderick, English champion, at London, Eng., May 25; knocked out Al Manfredo in four rounds at Des Moines, Ia., Oct. 9; knocked out Howard Scott in two rounds at Minneapolis, Oct. 13; knocked out Richie Fontaine in three rounds at Seattle, Oct. 20; won a ten-round decision over Jimmy Garrison at Los Angeles, Oct. 24; knocked out Bobby Pacho in four rounds at Denver, Oct. 30; and knocked out Jimmy Garrison in seven rounds at Cleveland, Dec. 11.

In 1940, Armstrong waded through six successive knockout victories before finally losing his title. On Jan. 4 at St. Louis, he knocked out Joe Ghnouly in five rounds; on Jan. 24 he knocked out Pedro Montanez in nine rounds at New York City; April 26 he knocked out Paul Junior in seven rounds at Boston; May 24, he knocked out Ralph Zanelli in five rounds at Boston; June 21, he knocked out Paul Junior again, this time at Portland, Me., the bout ending in the third round; Sept. 23, he knocked out Phil Furr in four rounds at Washington, D.C. It was on Oct. 4, 1940, that Armstrong relinquished the welterweight championship throne. He lost a 15-round decision to Fritzie Zivic in New York city. When Armstrong tried to regain the title on Jan. 17, 1941, Zivic knocked him out in 12 rounds at New York city. Despite the loss of his title, Armstrong fought on through 1942, 1943, 1944 and part of 1945. He engaged in 49 bouts as ex-champion, losing but seven of these, before retiring.

Zivic held the title only nine months. On July 29, 1941, Freddie (Red) Cochrane scored an upset victory, winning a decision over Zivic in 15 rounds at Ruppert stadium, Newark, N.J. Before he had a chance to make a title defense, Cochrane enlisted in the navy in 1942. He received his honourable discharge in 1944 and in 1945 engaged in nine non-championship bouts. Twice he was knocked out by the middleweight, Rocky Graziano. Each time the knockout came in the tenth round, at a time when Cochrane appeared on the road to a decision. In his first defense of the welterweight title, Cochrane was knocked out in four rounds by Marty Servo in New York city on Feb. 1, 1946. Servo, victim of a deviated septum, shortly afterward voluntarily surrendered the title when matched with Ray Robinson, undisputed challenger and regarded generally as the "uncrowned champion." This led to general approval of a bout between Robinson and Tommy Bell as a recognized welterweight title match, since the two stood out above other contenders. Robinson defeated Bell for the championship by outpointing Bell in a 15-round match at New York city on Dec. 20, 1946.

Other Disputed Classes.—The world lightweight championship became a disputed distinction in the 1937–46 period. Lou Ambers had become champion on Sept. 4, 1936, when he won a 15-round decision over Tony Canzoneri. On Aug. 17, 1938, Ambers lost the title to Armstrong, but in a return bout, Aug. 22, 1939, regained the title by winning a 15-round decision in New York city. Ambers held the title until May 10, 1940, when Lew Jenkins knocked him out in three rounds of a bout in New York city. In his first defense of the title, on Dec. 19, 1941, in New York city, Jenkins lost a 15-round decision which carried the championship to Sammy Angott. Then confusion developed.

Angott announced his retirement on Nov. 13, 1942, without making a defense. The announcement precipitated a mad scramble to establish a champion. The situation was complicated on Jan. 3, 1943, when Angott, reconsidering his retirement, announced his return to the ring. Automatically his retirement had vacated the title; when he returned and tried to claim championship rating, it was to find the New York State Athletic commission advanced on a tournament to determine a champion. Beau Jack was recognized as outstanding challenger for the title and a bout was arranged between Jack and Bob Montgomery with the commission's championship endorsement, May 21, 1943. Montgomery won this bout and the title on a 15round decision. Jack came back to win a decision over Montgomery in 15 rounds Nov. 19, 1943, and regain the title. On March 3, 1944, Montgomery won a 15-round decision over Jack, which carried the title with it, as far as



New York was concerned. Late in 1944 Montgomery went off to war as champion. He resumed ring operations early in 1945, however, but the title situation had not been cleared at the end of 1946.

Upon Angott's return to the ring, the National Boxing association recognized a bout between him and Juan Zurita as a title match. This was held March 8, 1944, in Hollywood, Calif., and Zurita won a decision in 15 rounds, and recognition by the N.B.A. as world champion. April 18, 1945, Ike Williams knocked out Zurita in two rounds of a bout in Mexico City, to become champion. Efforts were made during 1946 to arrange a bout between Montgomery and Williams which would produce an undisputed champion, but no immediate success attended the attempt.

Armstrong's retirement as world featherweight champion in 1938 threw the 126-lb. division into similar confusion. A succession of boxers, including Mike Belloise, Joey Archibald, Harry Jeffra, Chalky Wright, Petey Scalzo, Richie Lemos, Jackie Wilson, Jackie Callura, Phil Terranova, Willie Pep and Sal Bartolo, all vied for the title in a bewildering succession of matches which served no purpose other than to keep these boxers in semi-championship prominence. The situation was not remedied until June 7, 1946, when Pep, as the recognized champion of the New York State Athletic commission, and Bartolo, the National Boxing association's champion, engaged in a scheduled 15-round bout in New York city. Pep knocked out Bartolo in 12 rounds to become universal title-holder.

Similarly, the world bantamweight championship became shrouded in confusion. Harry Jeffra won the title Sept. 23, 1937, by outpointing Sixto Escobar at New York city in 15 rounds. On Feb. 20, 1938, Escobar won a 15round decision over Jeffra at Puerto Rico, to regain the title. Escobar defended the title in 15 rounds against Kayo Morgan at Puerto Rico, April 2, 1939, winning a decision. Late that year, however, Escobar surrendered the title when he outgrew the class. This left the 118-lb. class leaderless. Georgie Pace, Lou Salica and Tommy Forte were generally accepted as outstanding contenders for the title. Salica, as New York State's recognized champion, won a 15-round decision over Pace, the N.B.A. champion, in New York city, on Sept. 24, 1940. On Jan. 13, 1941, Salica won a 15-round decision over Forte in Philadelphia, to gain universal recognition. On Aug. 7, 1942, Manuel Ortiz won a 12-round decision over Salica in Hollywood, Calif., to become champion.

Ortiz, in 1943, defended the title seven times, defeating Kenny Lindsey at Portland, Ore., Jan. 1; Georgie Frietas, at Oakland, Calif., on Jan. 27; Salica, at Oakland, Calif., on March 10; Joe Robleto, at Long Beach, Calif., May 26; Robleto again, July 12, at Seattle, Wash.; Leonardo Lopez, at Hollywood, Calif., Oct. 1, and Benny Goldberg, at Los Angeles, Nov. 23. In 1944, Ortiz retained the title against Ernesto Aguilar, at Los Angeles, March 14; against Tony Olivera, at Los Angeles, April 4, and against Lou Castillo, at Los Angeles, Nov. 14. A dearth of worth-while competition, coupled with a short service in the army, kept Ortiz out of title combat in 1945. But in 1946 he retained the title in three bouts, knocking out Castillo in 13 rounds at San Francisco, Feb. 25; Lindsey in five rounds at Hollywood, May 25, and Jackie Jurich in 11 rounds at San Francisco, June 10.

The chaos attending the retirement in 1927 of Fidel LaBarba as world flyweight champion had its echo in the confusion which attached to this once popular class through the 1937-46 period. Great Britain cornered the market on 112-lb. boxers. American flyweights were almost nonexistent. Benny Lynch, an English boxer, gained recognition as world champion Jan. 9, 1937, when he won a 15-round decision over the Filipino, Small Montana, in London, Eng. But in the following year Lynch had outgrown the class, and a 15-round bout in Liverpool, Eng.,

Boxing Champions, 1937-1946

Light heavyweight

1935–39—John Henry Lewis* 1939 —Melio Bettina 1939-41-Billy Conn* 1941-46-Gus Lesnevich

*Abandoned title.

Welterweight

1935-38-Barney Ross 1938–40—Henry Armstrong 1940–41—Fritzie Zivic 1941–46—Freddie Cochrane 1946 —Marty Servo*, Ray Robinson *Retired.

Middleweight

1932-37-Marcel Thil* -Al Hostak and Solly Krieger (N.B.A.) 1938 -Solly Krieger, Al Hostak (N.B.A.); Ceferino Garcia 1939 (N.Y. comm.) -Tony Zale (N.B.A.); Ken Overlin (N.Y. comm.) 1940 1941 -Tony Zale (N.B.A.); Billy Soose (N.Y. comm.)+ 1941-46-Tony Zale

*Thil's international title disputed although his victory over Jones on a foul gave him clear claim. The N. Y. comm. and N.B.A. held elimination tourneys, Hostak emerging as N.B.A. champion and Garcia as N. Y. titleholder.

†Soose abandoned claim to title and Zale became undisputed ruler by defeating Georgie Abrams, who had beaten Soose three times.

Heavyweight

1937-1946-Joe Louis

Lightweight

1936-38-Lou Ambers 1938-39-Henry Armstrong 1939-40-Lou Ambers 1940-41-Lew Jenkins 1941-42-Sammy Angott*

-Beau Jack, Bob Montgomery (N. Y. comm.); Sammy Angott (N.B.A.).

-Beau Jack, Bob Montgomery (N.Y. comm.), Sammy 1944 Angott, Juan Zurita (N.B.A.).

-Bob Montgomery (N. Y. comm.), Juan Zurita, Ike Williams (N.B.A.). 1945

-Bob Montgomery (N. Y. comm.), Ike Williams

(N.B.A.).

*Angott announced his retirement on Nov. 13, 1942, leaving title vacant, but approximately two months later announced his comeback as challenger for the title.

Featherweight

1936-37—Petey Sarron 1937-38—Henry Armstrong* 1938–40—Joey Archibald 1940–41—Harry Jeffra, Joey Archibald 1941–42—Chalky Wright 1942-46-Willie Pep *Abandoned title.

Flyweight

1935–38—Benny Lynch* 1939 —Peter Kane† 1943-46-Jackie Paterson *Retired. †Abandoned title.

Bantamweight

1936–37—Sixto Escobar 1937–38—Harry Jeffra 1938–40—Sixto Escobar* 1940–42—Lou Salica 1942–46—Manuel Ortiz *Retired.

Sept. 22, 1938, between Peter Kane, English boxer, and Jackie Jurich, of the U.S., was recognized as a world championship, despite the fact Jurich's claim to U.S. supremacy was clouded. Kane won the bout and was recognized as champion. But Kane also outgrew the class and the title was generally regarded as vacant until June 19, 1942, when Kane returned to the ring, was knocked out in one round of a bout with J. Paterson at Glasgow, Scotland. Paterson, a native of Glasgow, Scotland, succeeded to a world title he held as 1946 drew to a close. He solidified his claim on July 10, 1946, by winning a 15-round decision over Joe Curran, English flyweight, at Glasgow.

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The Sport in Europe.—Few important outstanding professional boxing contests took place during 1937–46, although boxing generally had become more popular with the public and the standard of boxing had improved in speed and action, if not in science.

In 1946 Great Britain had at long last found an outstanding heavyweight in Bruce Woodcock to match against Joe Louis, the U.S. world heavyweight champion. France had provided a good middleweight in Marcel Cerdan. Sweden had a good heavyweight in Olle Tandberg.

World War II had hindered the production of leading professional boxers and, through it, many outstanding young boxers had been lost.

In 1937, Great Britain was endeavouring to arrange working agreements with a continental body known as the International Boxing union; in addition, a great deal of work was carried out by lovers of the sport to bring about boxing unity within the British empire. Further, an attempt was made to secure a proper understanding between the boxing authorities of Europe and the boxing authorities of the U.S.A. In 1938, a meeting was held in Rome, Italy, at which every European country, including Great Britain, together with representatives from America, met for the purpose of formulating a world's boxing commission. It was decided to appoint officers for the new association, but after U.S. representatives had returned to their own country no further action was taken.

It therefore appeared prior to World War II that no uniform working and no international sports agreements were possible. This position, however, had been greatly improved by the fact that during the war many nations had been represented in Great Britain by their serving soldiers who in their spare time had continued to box. This applied to all Allied forces, with the exception that U.S.' professional boxers were debarred by their services from taking part in such contests. Wartime international boxing together with the intermixing of the many nationals went far to break down the barrier of misunderstanding, with the result that, after the end of the war, a new federation, the European Boxing association, was formed, in which Great Britain, France, Belgium, Switzerland, Italy, Holland, Greece, Austria, Luxembourg, Sweden, Spain, Portugal and Czechoslovakia became members.

The British dominions were already in conversation with the British Boxing Board of Control at the end of 1946, with a view to forming an empire association, and the United States had appointed a co-ordinator for Europe and was ready to discuss the formation of a world's championship committee. (C. F. D.)

Boys' Clubs of America, Inc.

See Societies and Associations.

Boy Scouts

See Societies and Associations.

Bracken, John

Bracken (1883—), Canadian politician, was born June 22, 1883, at Ellisville, Ont. He was graduated from the Ontario Agricultural college and after completing his studies worked as a seed inspector for the Canadian government. In 1910, he joined the University of Saskatchewan in Saskatoon, Sask. as professor of field husbandry and later became president of the Agricultural College of Manitoba. In 1922 he accepted leadership of the newly formed Agrarian or Progressive party of Manitoba and that year was elected to the Manitoba legislature; he was re-elected in 1927, 1932, 1936 and 1940.

In 1932, Bracken headed a provincial government of Progressives and Liberals; and later the coalition was extended to include representatives of four other parties. Bracken emerged as a national figure in Dec. 1942, when he was chosen national leader of the Conservative party, whose name was later changed at his request to Progressive Conservatives. In Oct. 1944, he accepted nomination for the house of commons for Neepawa, Manitoba, in the general elections. He was returned in June 1945 and became the official leader for the opposition in the house of commons. During the draft riots in Quebec, Bracken demanded, March 2, 1945, creation of a royal commission to investigate the situation.

Braden, Spruille

Braden (1894-), U.S. diplomat, was born March 13, 1894, in Elkhorn, Mont. His father had founded the Braden Copper company which had interests in both North and South America. Braden graduated from the Sheffield Scientific school at Yale university with a degree in mining engineering in 1914. He later worked in executive positions in mining and related fields in South America. After World War I, he engaged in various financial and business enterprises, and also acted as adviser to Latin American governments on loan negotiations. In 1933, he entered the diplomatic service as delegate to the Inter-American Conference of American States in Montevideo. Later he became chairman of the U.S. delegation to the Chaco peace conference 1935-39. He was U.S. ambassador to Colombia, 1939-41. Shortly after Pearl Harbor, he was named U.S. ambassador to Cuba.

In April 1945, President Truman named Braden as ambassador to Argentina. In this post, Braden denounced fascism and actively campaigned for establishment of democracy in Argentina. This policy displeased Col. Juan Domingo Perón, then war minister, who countered with personal attacks on Braden and denunciations of "dollar diplomacy." On Aug. 25, 1945, President Truman announced Braden's appointment as assistant secretary of state in charge of South American republic affairs, succeeding Nelson A. Rockefeller. His appointment was delayed until Oct. 29, 1945, because of senatorial charges that he was "meddling" in Argentine affairs. On Oct. 31, 1946, however, the state department announced that Braden had the entire confidence of both President Truman and Secretary of State James Byrnes and that he would remain in his position.

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398 Bradley, Omar Nelson

Bradley (1893-), U.S. army officer, was born Feb. 12, 1893, in Clark, Mo., and was graduated from the U.S. military academy at West Point (1915). During World War I, he was stationed on the Mexican border and at training camps in the western United States. After the war, he was graduated from the Infantry school, the Command and General Staff school and the Army War college. Between 1929 and 1941, he served as chief of the infantry's weapons section, commandant at West Point and secretary of the general staff in Washington. In Feb. 1943, he assumed command of the 2nd corps in the North African theatre.

Bradley's skillful campaign in North Africa enhanced his reputation as a strategist and in Jan. 1944 Eisenhower named him commanding general of U.S. ground forces for the invasion of western Europe. Bradley directed the U.S. 12th army group in the landings in Normandy, June 1944. The following August his forces were made independent of the 21st army group headed by Field Marshal Bernard Montgomery, and Bradley was given equal status with Montgomery. Although at the time it was emphasized that the equal status given Bradley implied no criticism of Montgomery, subsequent "post-mortem" reports declared that Eisenhower, pleased with the U.S. break-through at St. Lo, decided to give Bradley that recognition. Under Bradley's guidance, the U.S. forces staged sweeping drives across France and hammered their way into the Siegfried line by the winter of 1944. During the German breakthrough in the Ardennes forest, the 1st and 9th U.S. armies were temporarily shifted to Montgomery's command. Explaining the German counterattack, Bradley declared that the thinness of the U.S. line at the point of the foe's breakthrough resulted from a "calculated risk" in which surplus divisions were concentrated for attack in other sectors. Bradley was raised to the temporary rank of a full general on March 13, 1945. In June of that year, he was named by President Truman as administrator of veterans' affairs, and the following September Bradley announced plans to overhaul the veterans' service for more efficiency. In early 1946, he became involved in a dispute with John Stelle, national commander of the American Legion, who charged that there had been a "tragic breakdown" in the Veterans administration; Bradley brushed off this attack as a "personal" one. Subsequently, President Truman said (Feb. 2) that he backed Bradley "up to the hilt" in this dispute. In later statements, Bradley accused Stelle of obstructing the VA program and of "misrepresenting our objectives."

Brandeis, Louis Dembitz

Brandeis (1856–1941), U.S. jurist, was born Nov. 13, 1856, in Louisville, Ky. Educated in elementary schools in Germany and the United States, he was graduated from Harvard law school in 1877 and practised in Boston, Mass., from 1879 to 1916. Beginning as a corporation lawyer, he later swung toward economic liberalism and won a reputation between 1907 and 1916 as an active foe of monopoly in business. In Jan. 1916, President Woodrow Wilson appointed him associate justice of the supreme court—the first Jew to attain this position. Justice Brandeis established a record as a militant liberal in the high court, and he frequently joined Oliver Wendell Holmes in dissenting opinions. He upheld the minimum wage law for women and was the author of a frequently cited majority opinion in which he defended

labour's right to picket but not to intimidate.

Of 16 major New Deal laws brought before the supreme court, Justice Brandeis sided with the administration in 10 instances, but in 1935 he voted against the National Recovery act, which aroused his dislike for "bigness." He resigned from the court in Feb. 1939 because of age and failing health and resumed an active role in the Zionist movement. He died in Washington, D.C., Oct. 5, 1941.

Brandy

. See Liquors, Alcoholic.

Brauchitsch, Walter von

Brauchitsch (1881–), German army officer, was born Oct. 4, 1881, in Berlin. The son of a cavalry general, he was educated in a military academy and became a lieutenant in 1900. He served during World War I as an officer on the German general staff and in 1933, he succeeded Marshal Werner von Blomberg as commander of the East Prussian army district, which later was transformed into the 1st army corps. In Feb. 1938, following Hitler's "purge" of the army, Brauchitsch succeeded Gen. Werner von Fritsch as commander in chief of the German army. He personally directed the wehrmacht campaigns in Poland, the Low Countries and France, and Hitler raised him to the rank of a field marshal on July 19, 1940. The following year, Brauchitsch supervised German army operations in the Balkans, Crete and in the soviet union. Following the failure of the nazi armies to capture Moscow, Hitler announced Brauchitsch's removal on Dec. 21, 1941; answering an "inner call," Hitler himself assumed the post of commander in chief. London dispatches in Dec. 1942 said that Hitler had summoned Brauchitsch back to Berlin for consultations but did not reinstate him. After his ouster, Brauchitsch was not prominent in the news until Aug. 19, 1944, when he wrote an article in Volkischer Beobachter saying that he agreed "heart and soul" with Hitler's appointment of Heinrich Himmler as commander of the German home army.

Brazil

A republic in eastern and central South America, Brazil is the most populous Latin country in the world. Language: Portuguese; religion: predominantly Roman Catholic, with about 500,000 Protestants of various denominations. President: until Oct. 29, 1945, Getulio Vargas (from 1930); from then to Jan. 31, 1946, José Linhares, former chief justice; after that date, Gen. Eurico Gaspar Dutra (constitutional term to expire in 1952).

Brazil has an area of 3,286,140 sq.mi. (8,337,218 sq.km.), second only to Canada in size in the western hemisphere. It occupies nearly half the South American continent, extending approximately 2,600 mi. north and south, with a maximum width of nearly 2,700 mi. It has a coast line of more than 4,900 mi., and is bordered on the north by Venezuela and the Guianas, on the west by Colombia, Peru, Bolivia, Paraguay and Argentina, and on the south by Uruguay. Geographically the country may be divided into five regions: the lowlands, drained by the Amazon and its tributaries; the La Plata river basin; the Guiana highlands; the Brazilian highlands; and the coastal plain. The Amazon and La Plata basins together constitute about three-fifths of the total area. Politically the country is divided into 20 states, a federal district and 7 territories, including the island of Fernando de Noronha, 225 mi. off the coast.

The population (1940 census: 41,565,083) was estimated at 45,300,000 as of Jan. 1, 1945. The population was classi-

fied as 22% urban, 9% suburban and 69% rural. The capital, Rio de Janeiro (coterminous with the federal district), is the largest city in Brazil, the fifth in size in the western hemisphere and the third largest Latin city in the world. It had a population of 1,776,369 in 1940, and an estimated population of 1,941,700 in 1945.

The greatest density of population is to be found in the states of São Paulo (75.8 per sq.mi. in 1940), Sergipe (65.6), Santa Catarina (32.3) and Rio Grande do Sul (31.9). The least densely populated states are Amazonas, Goiaz and Mato Grosso, and the territory of Ponta Porã. The density of population for the whole country as of Sept. 1, 1940, was 12.6 per sq.mi. The largest states in terms of population are: São Paulo (7,239,711 inhabitants, 1940), Minas Gerais (6,798,647) and Bahia (3,938,909). Brazil's hypothetical centre of population falls in the east south central part of Minas Gerais, not far from Belo Horizonte. Other important cities, besides Rio de Janeiro: São Paulo (1,308,-925 in 1940), Recife (347,558), Salvador (290,937), Porto Alegre (274,935), Belo Horizonte (210,350), Belém (208,-937), Fortaleza (174,051), Niteroi (142,531), Curitiba (141, 658) and Manaus (107,191).

Official statistical data offered no basis for determining the relative proportions of Negroes, Indians, whites and their mixtures. The following is a rough estimate: whites, 46%; Negroes, 30%; Indians, 24%. The whites predominate in the states of Santa Catarina, Paraná, Rio Grande do Sul and São Paulo; the Indian elements are of greatest relative importance in the Amazon basin, including the states of Pará and Amazonas and the territory of Acre, northern Goiaz and western Maranhão. The Negroid type predominates in the states of Bahia, Rio de Janeiro and Minas Gerais.

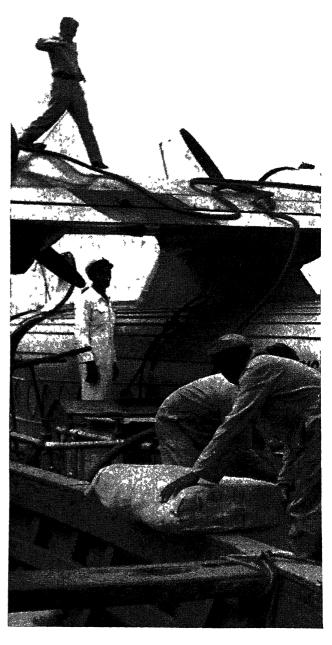
Immigration was controlled under provisions of the 1934 constitution, continued by the 1937 constitution. A presidential decree-law of Sept. 18, 1945, set up an immigration quota system on a yearly basis equal to 2% of the number of foreigners from each country who entered Brazil between Jan. 1, 1884, and Dec. 31, 1933. The constitution of 1946 set no limit on immigration. From Jan. 1, 1937, to Dec. 31, 1944, the following immigrants were admitted: 1937, 34,677; 1938, 19,388; 1939, 22,668; 1940, 18,449; 1941, 9,939; 1942, 2,627; 1943, 1,345; 1944, 1,612.

The Vargas Dictatorship.—The period from 1937-45 marked a new (and last) phase of the long dictatorship of Getulio Vargas which began in 1930. Prolonged clashes between leftist and rightist elements led to considerable unrest. The so-called "Communist Revolution" of Nov. 1935 had given Vargas the opportunity to order the arrest of many leftist leaders. A well-organized Fascist party, the Integralistas, led by Plínio Salgado, openly sought to gain control of the government; it was assisted, as later proved, by Italian and German agents. Vargas' constitutional term was to expire in 1938. In preparation for the presidential elections to be held the previous year, a coalition of antigovernment and non-Fascist elements was organized to back Dr. Armando de Salles Oliveira, former governor of the state of São Paulo. Vargas had declared several times that he would not seek re-election. On May 25, 1937, Dr. José Américo de Almeida was nominated as the government party candidate.

However, on Oct. 1, Vargas suddenly proclaimed a goday "state of siege" because of alleged threats of communism, and on Nov. 10, by decree, he dissolved both houses of congress, the state legislatures and all municipal councils. At the same time he promulgated a new constitution (prepared by his minister of justice, Francisco Campos), placing the entire control of the country in the hands of the president. All state and national courts were abolished, including the supreme court, which was replaced by a federal supreme tribunal. The presidential elections were postponed indefinitely. The presidential term was increased to six years, and Vargas was to continue in office until elections were held under the new constitution.

Furthermore Vargas, by decree of Dec. 2, 1937, abolished all political parties, prohibited the wearing of uniforms or other group insignia and denied to army and navy officers the right to join any political group. The *Integralistas*, claiming 1,000,000 members throughout Brazil, were especially affected by these regulations. On May 11, 1938, they staged a revolt in the capital, attacking the presidential palace. Repulsed by troops loyal to Vargas, the whole affair ended within a few hours. More than 1,000 persons

Cargo of Brazilian rubber being loaded into a Pan American clipper at Manaus, on the Amazon, for shipment to the United States during World War II



were arrested, but the Integralist leader was able to flee the country. After the Integralist revolt Vargas pursued with greater firmness his policy of nationalism and centralization.

Support for Allies.—At the outbreak of war in Europe in Sept. 1939 Brazil declared itself unequivocally on the side of the Allied cause, although officially proclaiming its neutrality (Sept. 6, 1939). Vargas' loyalty to the cause of Pan-Americanism was somewhat contradicted by his praise, in a public speech (June 11, 1940) of the axis powers and of totalitarianism. Despite this utterance, relations with the United States continued friendly.

Upon the entry of the United States into active war in Dec. 1941, the Brazilian government reiterated its support of continental solidarity and took measures to place German and Italian news agencies under special censorship and to freeze non-American bank deposits. At the Rio de Janeiro Conference of Foreign Ministers of the American Nations (Jan. 1942), Brazil stood as one of the most consistent supporters of continental solidarity, and severed relations with the axis powers. Special privileges were offered the United States for the establishment of air and naval bases along the Brazilian coast, particularly in the strategic northeastern bulge.

When several Brazilian ships were sunk by axis submarines, President Vargas promptly ordered the seizure of certain percentages of axis-owned assets as compensation. The Brazilian air force was ordered to patrol the coast and to attack any axis submarine encountered. In Aug. 1942 five Brazilian ships, including one loaded transport, were sunk by submarines off the Brazilian coast with heavy loss of life. Popular indignation resulted in a formal declaration of war against Germany and Italy (Aug. 22, 1942).

Brazil at War.—The most immediate military significance of Brazil's entry into the war as a member of the United Nations lay in its effect upon the submarine campaign and the active use of Brazilian bases by the armed forces of the United States and other Allied powers. The effect of Brazil's war declaration upon other nonbelligerent nations was also noteworthy.

Internally, the declaration of war was followed by extensive mobilization measures, including the control of stocks and prices of a number of commodities, rationing of foodstuffs and the combat against subversive activities of axis agents. In Dec. 1943 the Brazilian air force took over full responsibility for the aerial defense of the South Atlantic. Finally, an expeditionary force was sent to the European theatre, landing in Italy on July 16, 1944. The Brazilian unit, under the command of Gen. João Batista Mascarenhas de Morais, took over a section of the front as part of the army of Lt. Gen. Mark Clark and saw service in several engagements, acquitting itself creditably. Two more contingents were sent to Italy in the latter part of the year.

Politically, after a period of comparative calm during which the people put aside its grievances against the dictator, there appeared new signs of unrest. Taking cognizance of this state of affairs, Vargas promised that elections would take place after the war and that he would not seek re-election. On March 28, 1945, he issued a call for national elections to be held on Dec. 2, 1945. At last free from the restraints of censorship (abolished on Feb. 22, 1945) the press violently criticized the Vargas regime. In preparation for the elections, the democratic elements rallied around Air Brigadier Eduardo Gomes, a hero of the 1930 revolution. Vargas countered with two important measures: the announcement of the candidacy of Gen.

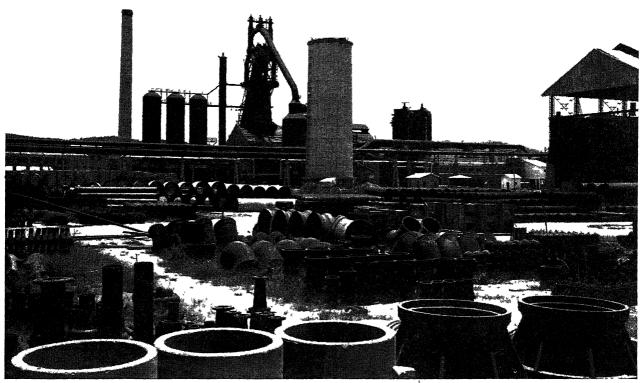
Eurico Gaspar Dutra, his minister of war, and his reconciliation with Communist leader Luis Carlos Prestes (in jail from 1936). This action was followed by the recognition of the soviet union on April 2.

Brazil's inflation during World War II was one of the worst in the western hemisphere. Prices climbed to three and four times prewar levels. The real estate and business boom was believed nearing an unhappy end by the middle of 1946. Many of the banks that had sprung up after 1940 were deeply involved in land speculation. At the end of 1944 the cost of living had risen to alarming heights; the percentage of increase was estimated officially at 250.78%. The blame was often placed on the Vargas regime, which had flooded the country with the equivalent of \$700,000,000 in paper money, or roughly 6 times the amount of money which was in circulation when it came to power in 1930.

External communications by air and by sea were considerably strained and at times even paralyzed by the war. Direct communications with continental Europe ceased in Dec. 1941 when the Italian "Latı" air service between Italy and Brazil (via Dakar) was discontinued as a result of the refusal of American oil companies to supply fuel. The Brazilian government granted permission to Panair do Brasil, a Pan American Airways subsidiary, to improve and construct landing fields in certain areas of Brazil in order to provide air transport north and south. The Panair service to Dakar, in Africa, offered a link with routes to Portugal and other European countries and also maintained a connection through Corumbá to the west coast of South America. The facilities of the former Condor (German) air line to the R10 de la Plata were reorganized at the end of 1942 under government supervision. Brazilian military planes maintained regular mail services over numerous unprofitable routes. Three important Brazilian air lines, the Navegação Aérea Brasileira, S.A. (established in 1941), Empresa de Transportes Aerovias Brasil, S.A. (1942) and Companhia Brasileira de Aviação, S.A. (1942), maintained air services among important cities within the country. On Sept. 10, 1946, an agreement was announced assuring the Pan American Airways the most important internal route in Brazil, from Barreiras to Rio de Janeiro and São Paulo. Two other shorter routes in central Brazil were guaranteed to U.S. aviation interests.

Under the stimulus of the war, the agriculture of Brazil rose to new heights. Besides coffee, cotton and cocoa, the principal export crops, other foodstuffs and raw materials became important during the period. Coffee declined in relative importance as war demands stimulated the production of other materials. Brazil continued, however, to be the world's greatest producer of coffee, accounting for more than half of the western hemisphere's total production. The production of cotton, cacao, sugar and rubber also soared.

Although industrial production continued to be primarily for domestic consumption, it grew sufficiently during the war period so that some manufactured products could be exported. In 1939 a "five-year plan" was adopted, calling for the outlay of some \$50,000,000 annually to develop the basic industries. Among the projects given immediate attention were the development of a Brazilian iron and steel industry. In 1940 an Import-Export bank loan of \$25,000,000 enabled the Brazilian government to put into effect the construction of the iron and steel mills of Volta Redonda. The first production of steel on a regular scale took place on June 23, 1946. The output of Volta Redonda at the end of 1946 was said to be 300,000 tons yearly. The coal utilized in Volta Redonda came



Blast furnace of the Brazilian Volta Redonda iron and steel mills, financed in equal parts by Brazilian capital and a \$25,000,000 loan by the U.S. Export-Import bank. Production began in June 1946 with an estimated annual output of 300,000 tons of steel

from the Santa Catarina state, where it had to be refined before shipment because of its high sulphur content.

From 1938-43 the industrial production of Brazil increased by 50%. In 1943 there were about 80,000 factories employing 1,500,000 persons as against 37,000 factories employing 1,000,000 persons in 1938. In the same period textile output rose 34%, accompanied by a sharp increase in textile exports. The leading industrial products were: foodstuffs, textiles, chemicals and pharmaceutical products, paper and rubber products, clothing, leather, glass and porcelain, metallurgical products. In the first 6 months of 1945 more than 253,000 automobile tires and more than 169,000 tubes were produced. The Firestone Tire company produced in 1946 its millionth tire in its Brazilian branch at Santo André, São Paulo. This plant had been in operation from June 1, 1940, supplying the bulk of Brazilian tires and some for export to other American countries. Geared to produce 104,000 tires a year, the plant could be extended to produce more than 228,000 a year with additional machinery. A goal of more than 2,000,000 tires for 1948 was announced. Plans adopted for further industrialization of the country during the 10year period 1945-55 represented an outlay of at least \$2,500,000,000 and possibly \$4,000,000,000, to be spent mostly in machinery and capital goods.

The first aviation motor entirely manufactured in Brazil was tried in flight on Aug. 20, 1946, near Rio de Janeiro. The plant, owned and operated by the government, initiated the manufacture of aeroplane engines in 1944 with materials received under lend-lease from the United States. A private concern announced plans to build automobiles, tractors, trucks and agricultural machinery in 1946. A large rayon factory, costing some \$18,000,000, was to be constructed in São Paulo state during the same year, backed

by Brazilian capital and operated by the Brazilian Nitro Chemical company.

To keep up with these developments, which placed Brazil at the head of all Latin-American nations so far as industrialization was concerned, the government adopted a vast plan for the development of hydroelectric power in 10 different areas, including the São Francisco valley, where a series of dams were to be constructed along the 1,800-mi. course of that river. In 1946 there were 1,597 electric companies in the country, controlling 1,808 power stations. The total potentiality of these plants was estimated at 1,230,865 kw.

Vargas Out; Dutra In.—Fearing that Vargas intended to perpetuate himself in power, the army occupied strategic points in the capital during the night of Oct. 29–30, 1945, and surrounded the presidential palace. A group of officers then visited Vargas and demanded his resignation. The president complied and transferred his powers to Chief Justice José Linhares in accordance with the 1937 constitution. Linhares pledged himself to hold elections both for president and members of the parliament on the announced date (Dec. 2, 1945) and to help to build up a democratic structure with the assistance of the armed forces.

During the pre-election campaign the following presidential candidates were presented: Yeddo Fiuza (former mayor of Petrópolis) for the Communist party; Gen. Eurico Gaspar Dutra for the Social Democratic party with the backing of sections of the Labour party under Vargas' leadership; Brigadier Eduardo Gomes for the National Democratic union; and Mario Rolim Teles for the National Agrarian party. The Integralist party supported Gen. Dutra's candidacy.

The people responded enthusiastically to the invitation to participate in the first free election in 15 years. More than 7,600,000 people registered. Despite the high hopes of the National Democrats, Gen. Dutra was elected by a

large majority, receiving 3,235,530 votes, as against 2,029,886 for Gomes, 586,523 for Fiuza and 9,991 for Teles. Dutra was declared elected on Jan. 28, 1946, and inaugurated on Jan. 31. Immediately after the inauguration, he announced the selection of his cabinet and other high positions in government. Only the former incumbents in the ministries of war, navy and air were retained.

The parliament met in the capital in early February with a total of 286 deputies and 57 senators. The government's party (Social Democrats) had 150 seats in the house and 26 in the senate. Other important parties represented were: the National Democratic union (84 and 13, respectively); the Brazilian Workers party (23 and 2); and the Brazilian Communist party (14 and 1). The Communist party representative in the senate was the party's leader, Luis Carlos Prestes. Former President Vargas was also elected to the senate as a representative for his native state of Rio Grande do Sul.

The parliament constituted itself as a constituent assembly and decided that the 1937 constitution would remain in effect until the promulgation of a new one. On June 1 the assembly approved the draft of a new constitution and limited the period for the presentation and discussion of amendments (about 5,000 considered) from June 5 to 24. On Sept. 18, 1946, the new constitution was promulgated.

The Constitution of 1946.—In general, the 1946 constitution was more liberal and democratic than the 1937 charter. It provided for a legislative power exercised by a national congress composed of two houses: a federal senate and a federal chamber of deputies. During the interval between legislative sessions a permanent commission was to exercise certain of the legislative powers. The members of the senate were to be elected for a nine-year period, and members of the chamber for a four-year period. Members of congress were to be elected by equal, direct, obligatory and secret suffrage under a system of proportional representation. The president and the vicepresident were to be elected simultaneously by a majority of votes, to hold office for six years. The president might not be re-elected within six years after the expiration of his term of office.

The judiciary was to be composed of a federal supreme court, federal courts of appeals, judges and federal military courts, judges and electoral courts, judges and labour courts and other judges and courts which might be created by law. Each state was to be governed under the constitution adopted by it, within the framework of the federal constitution. Municipalities were so organized as to assure their autonomy.

Section III of the new constitution, on social rights, empowered the federal government to create state-owned monopolies in the public interest. The government was authorized to suppress any organization, group, company or individual regardless of its nature, which endeavoured to dominate internal markets, eliminate competitors or exploit consumers through prices or any other form of oppression. The government was further empowered to proceed with the nationalization of banks, insurance, investment and similar enterprises, eventually forcing foreign companies operating in Brazil out of business, and precluding the entry into the country of new companies desiring to devote themselves to such activities. The nationalization of public utilities was to be regulated by special law. Mines and other subsoil wealth, as well as the waterfalls, were declared property distinct from the soil for the purpose of exploitation or industrial use. Their

exploitation was to be dependent on federal authorization or concession, such concession to be granted only to Brazilians or to firms organized in Brazil and thus assuring to the owner preference in the exploitation or in the participation of profits.

The section on immigration provided for the establishment of a special commission to select and handle all questions relating to the admission of foreigners, and fixed no limit on the number of immigrants that might be admitted in any given period.

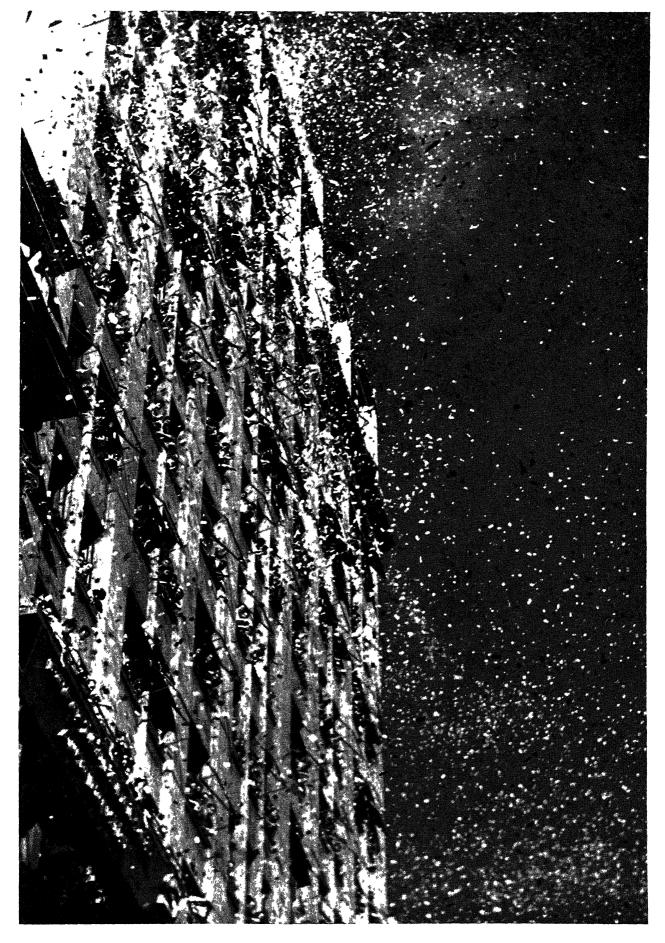
The new constitution also included some of the advanced social stipulations of the 1937 constitution, such as the 8-hour day of work, minimum age for employment (14 years), equal contributions from workers, employers and the government for social security funds, unemployment assistance, compulsory profit-sharing and the establishment of elementary instruction facilities by employers of 100 workers or more where public facilities for such instruction did not exist.

The government was authorized to intervene in labour disputes, but the principle of freedom of association and the right to strike were recognized, with certain limitations deemed necessary in the public interest. Labour courts were to be created for the solution of controversies between workers and employers. The ownership of journalistic enterprises and broadcasting stations was prohibited to corporations with shares represented by bearer certificates and to foreigners.

Both the federal and state governments were made responsible for public education. The constitution provided that a minimum of 10% of federal revenues should be devoted to educational purposes, and the states were required to devote at least 20% of their revenues to the same purpose. Academic freedom was assured, and although religious instruction was to be included in the curriculum of public schools, the students could indicate the sectarian tutoring preferred by them or their parents.

The Communists were the only party opposed to the adoption of the new constitution. Under the leadership of Luis Carlos Prestes, they became one of the most politically aggressive groups in Brazil. It was claimed that within a year the membership of the Communist party in Brazil had increased from 4,000 to 130,000. This growth alarmed some political leaders of other parties who had been endeavouring to form a coalition against the Communists. Anti-Communist sentiment grew throughout the country after their leader declared in an interview that in case of war against the U.S.S.R. he would form a resistance movement to prevent the entry of Brazil into such a war, which, in his opinion, could be nothing but imperialistic. As a consequence of this declaration, the constituent assembly considered proposals to declare the Communist party illegal on the grounds that its members swore allegiance to a foreign power. Steps were taken to oust all party members from positions of trust in the government. Food riots which occurred in Rio de Janeiro in early Sept. 1946 were attributed to the Communists.

International Stature.—Internationally, Brazil's prestige increased a great deal during the 1937–46 period. The nation took active part in the Eighth Pan-American Conference (Lima, Peru, 1938), the Conferences of Ministers of Foreign Affairs of the American Nations (Havana, Cuba, 1940, Rio de Janeiro, 1942 and Chapultepec, Mexico, 1945), and the United Nations conference of San Francisco, Calif. (1945). Brazil was the sixth country to ratify



the charter of the United Nations (Sept. 21, 1945) and was elected to fill one of the nonpermanent seats in the Security council. As one of the nations which signed the terms of surrender of the axis powers in Europe, Brazil participated in the Paris Peace conference of 1946.

Relations with the United States became increasingly more cordial because of Brazil's participation in the war effort, and because of U.S. sponsorship of certain Brazilian claims in the United Nations. A possible cause of friction between the two countries—the return of the air and naval bases constructed with the assistance of the United States along the Brazilian coast—was removed by the withdrawal of U.S. personnel as soon as circumstances and technical requirements permitted after the war.

There was considerable dissatisfaction in Brazil, however, over the ceiling prices imposed by the United States

9Combined total: 1,000 schools čEnrolment for all schools: 3,710,000 students. for coffee during the war period. An increase of three cents per pound on Nov. 17, 1945, did not prove satisfactory to the Brazilian producers, who claimed that wages and prices of materials had increased so as to wipe out their profits. In March 1946 the United States announced an extension of the subsidy to cover an additional 7,500,-000 bags through June 30, 1946. On May 7, 1946, a protocol for the extension of the Inter-American Coffee agreement was proclaimed by President Truman for one year (from Oct. 1, 1945). The protocol retained the framework of the Inter-American Coffee agreement but suspended the provisions relating to coffee quotas, with the exception that under emergency conditions, those provisions would again become effective upon a motion approved by at least 95% of the total vote of the Inter-American Coffee board. On Aug. 21, 1946, an agreement was signed between the United States and Brazil providing for the increase of the prices for green coffee (8.32 cents U.S. cur-

	•		il: Statistical Data			
ltem	Value	1938 Amount or	Value	1941 Amount or	Value	1944 Amount or
	(000's omitted)	Number	(000's omitted)	Number	(000's omitted)	Number
Exchange rafe United States		1 milreis = 5.8 cents		1 milreis = 6 cents		1 cruzeiro*=6 cents
Great Britain		80 milreis =£1		66.4 milreis =£1		82.8 cruzeiros =£1
Finance Government revenues	\$225 114 (£40 000)				\$446,406 (£110,633)	
Government expenditures					\$388,067 (£96,175)	
Gold reserves	\$60,964 (£12,470)				\$401,670 (£99,546)	
National debt	\$85,428,324 (£17,473,578)				•••	
Transportation	(,,,				***	
Railroads		20,332 mi. 1 <i>27</i> ,688 mi.		21,015 mi.†		•••
Navigable waterways		26,813 mi.				
Airways		32,213 mi.		43,945 mî.†		70,860 mi.
Telephones		241,561				
Telegraph lines		38,401 mi. 500,000				
Radio sets		300,000				
Gold		216,630 oz.		149,815 oz. ‡		210,000 oz.§
Coal		975,536 tons 220,460 tons		1,473,005 tons‡ 245,497 tons‡		2,242,421 tons§ 303,741 tons§
Iron ore		406,209 tons		281,691 tons‡		340,471 tons§
Crops Sugar cane		18,278,183 tons				24,506,277 tons§
Manioc		6,636,520 tons				9,946,755 tons§
Bananas		2,203,860 tons 1,937,269 tons				2,258,657 tons§ 2,074,604 tons§
Coffee		1,613,925 tons				1,101,579 tons
Livestock Cattle		41,883,000		41 544 000†		
Swine		23,543,000		41,546,000‡ 21,687,000‡		
Sheep		14,167,000		10,855,000‡		
Wood		544,081 tons				
Carnauba wax		10,940 tons 18,119 tons				
Brazil nuts		32,906 tons				
Babassu kernels		51,300 tons				
Total			\$1,363,698(£338,219)	•••		
Food and beverage			\$531,394(£131,794)	•••		
Textile			\$253,023(£62,754) \$131,698(£32,663)	•••		
Chemical and pharmaceutical	****		\$105 265(£26 107)			
Exports—total	\$139.144(£28.461)	17,113,000 bags	\$454,353(£112,603)† \$119,097(£29,516)† \$39,039(£9,675)†	2,933,000 tons† 7,280,000 bags†	\$650,048(£161,102) \$235,096(£58,264)	2,945,000 tons 13,555,000 bags
Coffee (raw)	\$56,349(£11,526)	296,000 tons	\$39,039(£9,675)†	170,000 tons†	\$40,479(£10,032)	119,000 tons
Cacao	\$12,908(£2,640) \$12,638(£2,585)	141,000 tons 61,000 tons	\$13,124(£3,253)† \$24,072(£5,966)†	79,000 tons† 67,000 tons†	\$18,657(£4,624) \$10,718(£2,656)	112,000 tons 21,000 tons
Meat and meat products	\$11 319/£2 315	88,000 tons	\$43,529(£10,788)† \$281,373(£69,733)†	149,000 tons†	\$20,981(£5,200) \$484,643(£120,110)	58,000 tons
Imports—total	\$71,023(£14,527)	95.000 tons	\$281,373(£69,733)† \$42,684(£10,578)†	4,780,000 tons† 33,000 tons†	\$484,643(£120,110) \$42,446(£10,519)	4,235,000 tons 38,000 tons
Vehicles and accessories	\$36,118(£7,388)	92,000 tons	\$31,569(£7,824)†	24,000 tons†	\$29.792(£7.383)	22,000 tons
Cereals	\$32,724(£6,693) \$25,109(£5,136)	1,147,000 tons 1,407,000 tons	\$37,038(£9,179)† \$28,143(£6,975)†	1,073,000 tons† 836,000 tons†	\$67,907(£16,829) \$30,260(£7,499)	1,343,000 tons 867,000 tons
Defense	4201107 (201100)		\$20,143(20,773) <u>[</u>		\$30,200(207,477)	807,000 10115
Standing army personnel		98,712 213,318		112,300‡ 258,000‡		
Standing navy personnel		6,000		238,0001		
Standing air force personnel . Military expenditures	\$62,949(£12,876)	2,700		2,700‡		
Education	402,747(2012,070)					
Primary schools		2,662,243¶		42,794		39,000
Secondary normal and tech-				3,791,500 739†		δ Q
nical schools enrolment Universities and colleges		P000,000		•••		ð
Enrolment		25,441¶		•••		\$ \$ \$ \$
*On Nov. 1, 1942, official design	gnation of currency unit	• •				-

rency). This increase was in addition to the ceiling price established by the agreement of Dec. 27, 1941.

With reference to other American nations, Brazil maintained a friendly attitude. Brazil recognized Gen. Juan Perón's regime in Argentina, refusing to take any action against him which might be construed as antagonistic.

(R. p'E.)

The Brazilian Expeditionary Force.—In July 1944, the Brazilian Expeditionary force (F.E.B.) took up its position on the Italian battle front. It rapidly accustomed itself to the new and harsh topographic conditions and kept perfect discipline.

War Minister Dutra wished to verify at first hand the situation of his troops, and accordingly visited the front in October, passing through the lines and command posts. The British government invited Dutra to go to Great Britain and received him with special honours. Returning to Naples, he was "briefed" by Gen. Zenóbio da Costa on the situation of Brazilian troops; he then returned to Brazil.

In Nov. 1944 Brazilian troops were in the valley of Serecchio. Shortly thereafter, in nearly unbearable cold, they went into the Rhenish valley, in the heart of the Apennines, where they remained entrenched until Feb. 1945. Immediately afterward they fought at Cassino, and then performed the brilliant manoeuvre of Castelnuovo, applauded by Lt. Gen. Mark Clark, commander of the 5th army, and by Gen. Willis Crillemberger, commander of the 4th corps.

A series of clean-up operations followed in Monese, in the Panaro valley, in the region of Zecca and in the area of Vignola.

It was the task of the Brazilian army to prevent the junction of German troops fighting in the Apennines with those operating north of the Po. Brazilians encircled the 148th German infantry division, crossed the Po at Cremona and Placencia, and established a bridgehead to the west through Alexandria to Turin. The army operated, finally, at the foot of the Alps, and consummated its junction with French forces.

(A. B. PA.)

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Bread and Bakery Products

The baking industry can be viewed as a food-processing industry in which it is the baker's function to utilize his special knowledge and skill to convert flour and other ingredients into appetizing, nutritious and economical baked foods. Because the principal ingredient of bakery products is flour, the baker fundamentally is a converter of wheat into human food. In all of its processed forms, of which bread is the most important item, wheat is a staple food in the diet of Europeans and people of European origin. Under ordinary conditions, breadstuffs supply from 25% to 40% of the total calories ingested by western peoples and one-third or more of the protein. Depending largely on the variety of wheat and the locality where it is grown, and even more on the degree of retention of its nutrients in processing, wheat contributes importantly to the dietary requirements for thiamin, niacin, phosphorus and iron, and furnishes a significant amount of riboflavin and other substances naturally found in wheat. In times of war or famine, bread is the most important single foodstuff, and efforts of governments are directed to the maximum production of wheat and to the greatest economy in its processing, distribution and utilization.

Technical Developments.—As in many other long established food industries, developments in the technology of baking during the decade 1937-46 were evolutionary in character. Methods earlier developed for measuring the physical characteristics of flour which are of importance in baking were extended so that it became possible to determine beforehand the proper amount of water to be added to flour in order to make a dough of suitable consistency for handling in large mechanically-equipped bakeries. The Brabender Farinograph came into more extensive use not only for this purpose but also for determining the proper length of time of mixing the constituents of a dough in order to obtain optimum development of the gluten. The amylograph, also devised by Brabender, became more extensively used in laboratories for characterizing cake flour. With the use of such instruments, as well as others, the baking industry was put on a more scientific basis; however, the art of baking still predominated over technology in the smaller handcraft shops.

Further studies were made of the enzymes of flour and their significance in baking; indeed, this field was the subject of a monograph published under the auspices of the American Society of Cereal Chemists. A monograph on the bromate effect was written in Danish and translated into English; with the recognition of the improvement in baking produced by minute traces of potassium bromate added to flour, it became possible to make use of many varieties of flour milled from European wheats which had inferior baking qualities and which tended previously to restrict their use primarily to the feeding of animals. A notable development in baking technology was refrigeration of dough at a temperature of about 35° F. and a relative humidity of 85%, under which conditions it can be kept for several days prior to use. As a result of the application of this process, much night work was eliminated and, because bread and rolls, etc., can be baked several times during the day in quantities to meet consumer demands, economies were effected and fresher products offered to consumers. The practices of slicing and wrapping bread became almost universal in the United States and to a limited extent were adopted in other countries. Waxed paper wrappers contributed to cleanliness, and their use improved the keeping quality of bread.

Statistics of the Industry.—In the United States, there had been for many years a transition from home baking to commercial baking, a trend which was accelerated during World War II. In 1938–39, the per capita consumption of flour was 154 lb., of which 74 lb. were processed by the baker and 69 lb. by home bakers; the remaining 11 lb. of flour were used for other foods. In the crop year 1943–44, the per capita consumption of flour had risen to 160 lb., of which 95 lb. were processed by the commercial baker and only 51 lb. by the home baker. In 1944–45, the per capital consumption was estimated at 161 lb., 97 lb. being processed by commercial bakers, 49 lb. by home bakers, and the remaining 15 lb. used for other foods.

Among the food industries of the United States, baking continued to hold first place in payroll size and number of employees and was second to the meat packing industry in the dollar value of its products. The value of bakery products in 1939, as estimated by a government census of manufacturers, showed a total production valued at about

\$1,200,000,000, but this estimate did not include the commercial production of biscuits, crackers and pretzels, which would bring the total value of the industry's production to about \$1,500,000,000. No census of manufacturers was taken during the war years, but estimates of sales volume indicated a tremendous increase. A writer for the American Baker in May 1945, estimated that in the calendar year 1944, the total value of bakery products was \$2,340,516,000. Of this total, \$1,349,563,000 represented the value of the production by large wholesale bakers, \$543,185,000 represented the estimated value of the products of small retail bakers, and \$447,768,000 represented the estimated value of the products of the biscuit and cracker bakers.

In Great Britain, there were nearly 27,000 bakeries in operation during the war years, as shown by reports of licences issued, a fact which emphasized that in Great Britain as in most other countries with the exception of the United States, commercial baking was conducted largely by small retail shops. However, the largest bakery in the world was reputed to be in London, and the second largest, in 1946, in Buenos Aires. According to figures of the Office of Price Administration, there were approximately 30,000 commercial baking establishments in the United States during the war years, but many of these were small shops, and it was estimated that 90% of the production was baked by less than 8,000 bakeries.

Wartime Regulations.—In every country, governments regulated the baking industry during World War II, with the aim of avoiding waste, effecting economies in the use of food, and increasing the nutritive quality of bread as a factor in maintaining the health of the people.

Great Britain.—In the United Kingdom, all bakeries were licensed during the war, and the products were subject to price control. Because of the shortage of fats and oils, no more than two pounds of fat was permitted to be used with each sack (280 lb.) of flour. Flour was required to be of longer extraction, and as a consequence white bread of a darker colour was produced. To some extent, a mixture of other grains was required, and at times the inclusion of potatoes in bakery products was made mandatory. The British baker developed considerable ingenuity in incorporating mashed boiled potatoes in bakery products, especially in cakes, but the preparation of the potatoes required much labour.

United States.-Regulations developed under the War Powers act required bakers to effect economies in production, such as the elimination of double wrappers, and the prohibition of the practice of taking back unsold bread from grocery stores. The amount of shortening and sugar used in bread production was restricted. Dried skim milk, which contributes importantly to the nutritive quality of bread and other bakery products, became scarce because of the use of this important food in relief feeding, and for use by the military forces. Not until the end of the war was it found necessary in the United States to conserve flour. During 1946, because of the demand for wheat in feeding people in other parts of the world, bakers were restricted in the use of flour, and the flour itself was required to be of longer extraction. Whereas, under ordinary conditions, flour represented about 72% of the weight of the grain from which it was milled (the remaining 28% being used for animal feeds and other products) a government order required the miller to supply flour of not less than 80% extraction. This order was rescinded in October 1946, as a result of the record-breaking wheat crop of 1946 and because experience showed clearly that the measure itself did not result in a great saving of wheat.

Germany.—A report of a British committee which visited Germany in 1946 dispelled the rumour that the Germans had incorporated sawdust in bread during the war. They found that sawdust had been used as a dusting flour in the production of rye bread; buckwheat bran was similarly used as a dusting flour in the production of white bread. Most of the bread in Germany was made from rye flour of high extraction, and it was customary to mix with it barley and potato flour. Consideration was given to vitamin fortification of the bread to improve its nutritive value, but apparently the idea was abandoned because of the lack of vitamin supplies.

Nutritional Improvement.—The most significant accomplishment of the baking industry during the decade doubtless was the bread enrichment program. This program was launched in 1940, when the need for better national nutrition was made evident by dietary surveys which showed that the U.S. prewar diet did not supply enough thiamin, riboflavin, niacin and iron. These nutrients are found in whole wheat bread, but consumer preference is for white bread, which is consumed daily in substantial quantities by all segments of the population. The addition to white flour and white bread of thiamin, riboflavin, niacin and iron in amounts related to the human needs for these nutrients improved the national dietary and accomplished this improvement at low cost and without changing food habits. The comparative composition of a pound of plain white bread, enriched bread and whole wheat bread was reported by the Bureau of Human Nutrition and Home Economics as follows:

								Plain mg./lb.	Enriched mg./lb.	Whole Wheat mg./lb.
B ₁								0.3	1.1-1.8	1.3
B ₂									0 <i>.7-</i> 1.6	0.7
Niacin								3	10-15	16
lron .									8-12 .5	11.8
Calcium									254	272
Protein		_			_			39 arams	39 arams	43 arams

Enrichment was widely adopted in Sweden, where it was estimated 85% of the flour was being enriched, and in Newfoundland, where all flour was required to be enriched. In most other countries, undermilled flour and darker breads were adopted as a wartime measure, resulting in improved nutritive values of the national dietary over what would have been obtained from bread made with white flour. The baking industry of the United States declared its intention to continue the enrichment of bread and rolls with the B-vitamins and iron as a permanent measure. By the end of 1946, there were 19 states which had enacted laws requiring the enrichment of all white bread and rolls. The territories of Hawaii and Puerto Rico had enacted similar legislation. (See also Flour.)

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Breadner, Lloyd Samuel

Breadner (1894-), Canadian air force officer, was

born July 14, 1894, at Carlton Place, Ont. Educated at Ottawa, he served in the royal air service, first as a flight sub-lieutenant in the royal naval air service in 1915, later transferring to the royal air force. By Nov. 1918, he had attained the rank of major. He was associated with the royal Canadian air force as of 1920, becoming certificate examiner for the air board. Two years later, he became director of civilian aviation, but in 1928 returned to military aviation, serving as acting director of the R.C.A.F. (1928–32).

In 1940, following the outbreak of World War II, he was appointed air vice-marshal and chief of the air staff. Named air marshal in 1941, he was again promoted, Nov. 11, 1943, to the rank of air officer commanding the R.C.A.F. overseas. Air Marshal Breadner was created a companion of the Order of the Bath in the King's Honours List of 1943. On March 17, 1945, he retired and a few days later was given the rank of air chief marshal.

Brereton, Lewis Hyde

Brereton (1890—), U.S. army officer, was born June 21, 1890, in Pittsburgh, Pa. A graduate of the U.S. naval academy at Annapolis (1911), he was commissioned an ensign, but later resigned to become a lieutenant in the army's coast artillery corps. He took flight training in 1912 and commanded one of the first U.S. flying units on the western front during World War I. An early exponent of dive-bombing, Brereton was commander (1922) of the first aviation attack group in the army air corps. He held several important air commands in the years preceding World War II, and in Nov. 1941, he took command of the army air force in the Philippines.

After the loss of the Philippines, he was made chief of the U.S. air forces in India. Transferred to the middle east, in June 1942, as U.S. air commander, he became U.S. commander in chief of the U.S. army air forces in the middle east in Feb. 1943. On Aug. 10, 1944, the Allies revealed that a new airborne army had been established with Brereton as commander in chief. His force launched an air-borne invasion of the Netherlands, Sept. 17, 1944, in a daring but vain attempt to cross the Rhine river at Arnhem. On March 24, 1945, some three divisions of his 1st Allied airborne army landed behind German lines on the east bank of the Rhine. This operation, smoothly coordinated with other Allied crossings, was successful.

After the end of the war in Europe, Gen. Brereton was a member of Gen. Courtney Hodges' U.S. 1st army staff. In March 1946, Gen. Brereton was appointed to the Joint Chiefs of Staff Evaluation board that reported on the two atomic bomb tests at Bikini Island. Brereton's work, *The Brereton Diaries*, recounting the air war in the Pacific, middle east and Europe, was published in the fall of 1946.

Brett, George Howard

Brett (1886—), U.S. army officer, was born Feb. 7, 1886, in Cleveland, O. He was graduated from Virginia Military institute, 1909, and attained the rank of major during World War I. He retired from active service in 1920, but later returned to the army, specializing in military aviation and winning a rating as an army command pilot. In Oct. 1940 he was promoted to the rank of major general. Prior to the entry of the U.S. into World War II, Gen. Brett toured the middle east and Britain for the purpose of co-ordinating British and U.S. aircraft production. After the Pearl Harbor attack plunged the United States into the conflict, Gen. Brett, British Gen. Archibald Wavell and Generalissimo Chiang Kai-shek set up a military council in Chungking the purpose of which was joint and

common prosecution of the war against Japan. On Jan. 3, 1942, Gen. Brett was appointed deputy supreme commander to Gen. Wavell for the far east. On Jan. 10, 1942, he was promoted to the rank of lieutenant general. The following March he was appointed commander in chief of Allied air forces in the Southwest Pacific. On Nov. 4 (1942) Gen. Brett succeeded Gen. Frank M. Andrews serving as head of the Caribbean defense command until he retired from active duty in 1945.

Bretton Woods

See Exchange Control and Exchange Rates; International Bank for Reconstruction and Development; International Monetary Fund.

Brewing and Beer

Prior to the prohibition act of Jan. 16, 1920, the brewing industry in the United States comprised 1,392 individual breweries with a total capitalization of \$792,-914,000. It employed directly 75,404 persons. After 13 years of prohibition, the production and sale of beer was relegalized by act of congress on April 7, 1933. By 1937 the industry had again become stabilized as an important economic factor, with annual sales reaching the 50,000,000 bbl. mark. The ten years following 1937, witnessed the inauguration and implementation of many new programs by the industry.

Self-Regulation.—On June 5, 1938, the brewing industry launched a program of self-regulation, using Nebraska as the testing ground. The industry set up a state organization directed by a nonindustry executive, to develop a program of co-operation with state and local enforcement authorities. Retail outlets within the state were checked by industry investigators and, if violations were found, proper warnings were served upon the proprietors. Failure to correct conditions complained of, within a reasonable time, resulted in submission of evidence to licensing authorities by industry representatives, usually leading to suspension or revocation of licences. The shutting off of beer was another punitive measure employed by the brewers' self-regulation committee against offending retailers who failed to heed warnings. The most progressive results, however, were obtained through educational efforts.

Following the success of the Nebraska experiment, the industry's self-regulation program was extended to other states until in 1946 there were 16 states operating under the program sponsored by the United States Brewers foundation. This program was unique as a practical demonstration of industry self-regulation, and was made the subject of many commendatory articles in national magazines and the press. It won the backing of the vast majority of retail beer dealers, who found the program was in their best interests. Proof of the efficacy of the program was the wide acknowledgment by public officials of its aid in enforcement of laws governing the sale of beer.

Army and Navy Co-operation.—Even before the U.S. Selective Service act was passed, the leaders of the industry realized that self-regulation might be complicated by the mushroom growth of many communities in the vicinity of army training camps. It seemed likely that enterprises set up to attract the service men would also include retail beer establishments. To ensure that retail beer establishments would measure up to high standards and provide wholesome environment for service men, a portion of the brewing industry comprising the United States Brewers

foundation organized its army and navy co-operation program. It was administered and staffed by men who acted in liaison with army and navy authorities to promote moderation and sobriety among the services, and to provide wholesome conditions in places where beer was sold at retail in areas near service posts.

The co-operative efforts of the brewers, aided by the retailers and wholesalers, won commendation of the war and navy departments. They officially directed commanding officers of posts and stations to make use of the foundation's assistance wherever conditions warranted.

In a letter to the foundation, written Dec. 14, 1945, Secretary of War Robert P. Patterson said: "It is gratifying to know that the relations between the staff of the Foundation's Army and Navy Co-operation Program and the various military and civil law enforcement authorities have been of such benefit to members of the armed forces through the maintenance of high standards among retail beer outlets." A similar commendation was received from the navy department, signed by Rear Adm. William M. Fechteler, assistant chief of naval personnel.

On Dec. 30, 1942, the Office of War Information issued a report on a coast-to-coast survey made by OWI of drinking conditions in and around army camps. The report said, "No American army in all history has been so orderly," and in several instances cited the benefits of the availability of beer in and near army camps.

Secretary of War Henry L. Stimson previously had stated the war department's attitude on the policy of making beer available on military reservations. In a letter to Senator Robert R. Reynolds, then acting chairman of the senate committee on military affairs, May 2, 1941, Secretary Stimson said: "This policy has caused a degree of temperance among army personnel which is not approachable in civil communities now, nor was as high a degree of temperance attained either in or out of the army during the days of national prohibition. Under this policy, military personnel are encouraged to remain on the reservation and enjoy refreshments under conditions conducive of temperance."

The War Years.-Wartime restrictions curbed the amount of barley malt the brewers were permitted to use. Beginning on March 1, 1943, brewers were limited to 93% of the quantity they used in the corresponding periods of the base year (March 1, 1942, to Feb. 28, 1943). Exemption, however, was made for brewers using 70,000 bu. or less annually. Beginning March 1, 1945, brewers using over 70,000 bu. were cut to 81.8% of the amount of malt they used in each quarter of the 1942 base year. After Dec. 1, 1945, brewers were permitted to use 20% more malt than they had used during the previous quota periods. This order remained in effect until the more drastic order, limiting brewers to 70% of their 1945 usage of grain, was ordered by the president, effective March 1, 1946. On Sept. 1, 1946, the latter restriction was modified, permitting brewers to use 85% of the quantity of grains used in the corresponding quarter of 1945. On Oct. 21, 1946, the order was further modified to 90%, retroactive to Sept.

Because of favourable conditions in the grain supply situation, the government made a further liberalization of restrictions on brewers' use of grains on Dec. 1, 1946. The amended order authorized brewers to use, in the three-month quota period beginning on that date, an amount of grain equal to 100% of their use in the corresponding quota period of the previous year. Wheat and

table rice remained prohibited.

As a result of the reductions in ingredients, the brewing industry was unable to produce enough beer to meet demand during much of the war and early postwar period. The amount available for civilians was further reduced by government orders setting aside specific percentages of malt for beer production for the armed forces. Military authorities had recognized the morale value of beer, and in order to guarantee an adequate supply of the beverage for the armed forces, the government directed brewers to set aside 15% of their use of malt for the brewing of 3.2% beer for military personnel. This setaside order was reduced to 5% on Dec. 1, 1945, to 4% on June 13, 1946 and 3% on Sept. 1, 1946, in line with the return of a large number of the military to civilian life and correspondingly reduced requirements for the armed forces. Most of the beer exported to the armed forces was contained in one-trip bottles and cans, which were available only for the armed forces. Cans and one-trip bottles for beer had become civilian casualties early in the war.

Throughout the war, equitable distribution of beer on the home front became a problem. Many brewers established a quota system, based on dealers' sales of the previous year, consideration being given to areas with a concentration of war workers. This could not solve the shortage, but it did ensure distribution of beer on an equitable basis

In common with other industries, the brewers laboured under shortages and other wartime curbs. Manufacturers of brewing equipment had converted to war production, obliging the brewers to get along without replacements. Construction work had to be postponed "for the duration" and until materials became available again. Clydesdales and percherons, once a common sight before motorized delivery, emerged from retirement to help relieve local transportation problems. Many brewers voluntarily reduced their shipping radius* to co-operate with the Office of Defense Transportation and to help relieve freight congestion.

Brewing and the Grain Supply.—The year 1946 opened with bright prospects for the brewing industry, with the lifting of many restrictions, including the curb on the use of malt. On March 1, 1946, however, the government directive referred to above cut use of malt and other grains by 30% of the amount used by brewers in 1945. The order further prohibited altogether the use of wheat in the production of malt beverages. A very small amount of wheat—less than .0008 of the U.S. 1945 crop—had been used by the brewers in 1945 to offset, in part, the reduction in their allotment of malt, but wheat had rarely been used as a brewing ingredient under normal conditions.

Immediately following receipt of the presidential order, directors of the U.S. Brewers foundation adopted a resolution urging all brewers of the nation to cut production of beer and ale in proportion to the reduction in their grain supply so that quality would be maintained.

Some economists pointed out that while the intent of the conservation order was laudable and would enable more grain to be sent to needy populations abroad, the economic loss to the nation was considerable. This included the loss of federal taxes (\$8 per barrel), state taxes, in brewery wages, loss to allied industries and cost of the grain to the government.

Unlike other food industries which draw upon the farms for their source of ingredients, the brewing industry extracts only a portion of the total nutrients contained in the raw materials. It returns the remaining con-

stituents—estimated at 35% of the original total—to the farmer in the form of feedstuffs containing most of the proteins in the original grain. In addition, it supplies the farmer with by-products of measurable value.

In the first category are residual grains, which consist of wet and dried brewers' grains recovered from the brewing process. These are of high value both for livestock and poultry feeding. They are considered an excellent protein supplement for dairy cattle when used as part of the ration.

Brewers' yeast, a by-product of the brewing process, was supplied in increasing quantity in the latter half of the decade 1937–46, both as a human nutrient supplement and as a protein and vitamin supplementary feed for livestock and poultry to provide a balanced ration. It is the richest known natural source of vitamins of the B complex and contains between 40% and 50% of high-grade protein. Its nutritional value in enriching the diet of the men in the armed forces and in civilian war production was recognized, and the American brewing industry, at the request of the U.S. War Food administration, organized its facilities to increase the production of yeast. Production was increased to approximately 25,000,000 lb. annually.

Technical Developments.—Chief among the technical and technological developments during the decade were the following: introduction of a new type of lauter tub to permit faster lautering (draining off) of the wort; increased efficiency in bottling operations through new high-speed bottle fillers and spray type of pasteurizers; introduction of such materials as sorghum grains and other supplementary adjuncts in brewing to offset the shortage in corn and rice; more extensive use of glass-enameled, stainless steel and aluminum tanks in cellar operations; introduction of ultraviolet radiation in brewery cellars and cooler rooms as an aid to air purification; increasing practice of wort and beer filtration through diatomaceous earth.

Sales Records.—The year 1937 marked the first time since the relegalization of beer that sales topped 50,000,000 barrels. The demand continued to increase until in 1945, sales topped 80,000,000 barrels, breaking all previous records. During this period the number of breweries decreased from 750 in 1935 to 463 in 1945.

The decline in the number of breweries was explained in various ways. Relegalization of beer, in 1933, had attracted to a highly specialized industry many inexperienced men who saw an opportunity for quick profits on their investments or promotions. Under-financing and inefficiency proved fatal to a number of enterprises. Real stabilization in the industry was not reached until the number of plants fell below 500.

Some of the reasons for the high sales were the record national income, increase in population, heavy pay rolls and the large number employed in war production and heavy industry, and the increased acceptance of beer as a beverage of moderation. Studies revealed that persons engaged in work requiring physical energy consumed more beer than the average, because of their need for relaxation, refreshment and restoration after a hard day's work.

The industry's sales statistics were based on U.S. internal revenue reports of taxpaid withdrawals for the fiscal years ending June 30. As cited here, the reports cover the tenyear period for the fiscal years 1937 to 1946. Following are the sales in U.S. barrels (31 gal.) for those years: 1937, 55,391,960; 1938, 53,926,018; 1939, 51,816,874; 1940, 53,014-230; 1941, 52,799,181; 1942, 60,856,219; 1943, 68,636,434; 1944, 76,969,764; 1945, 79,590,598; 1946 (official but not audited), 80,735,720.

Package sales, considered significant of the extent of the

home use of beer, maintained progressive gains throughout the ten years, reaching a new high in the calendar year 1945 when 64.4% of all taxpaid withdrawals represented sales in bottles. They did not include sales in cans and one-trip bottles to the armed forces overseas. These, being exported exclusively for the armed forces, were not federally taxed. In 1934, 75% of the brewing industry's output was sold in barrels. Government reports made no breakdown of beer sales in the years prior to prohibition, but draught (keg) beer was dominant then.

Numerous factors probably were responsible for the trend toward package beer, and it would be impossible to determine the relative importance of each. It is likely that the following were most important:

- 1. Increased consumption of beer in the home. Consumer surveys showed that approximately half of the families in urban communities bought beer for home consumption. Most of these purchases were made in grocery stores;
- 2. More convenient and attractive packaging. After 1935 a wider choice of containers, including new styles of cans and bottles, was made available to the public. These containers were backed by the competitive advertising efforts of the glass bottle and can makers, and the brewers themselves advertised package beer extensively;
- 3. Advent of mechanical refrigeration in the home; this made it possible for housewives to store package beer as a home staple. Roomier space for provisions than was possible in the old-fashioned icebox, and constant cooling temperature, also helped;
- 4. Limitation of off-premise sales to package beer in some areas;
- 5. Lower licence fees for off-premise sales, attracting many grocers to the field of beer retailers.

Taxes.—All beer, before packaging for sale, is run through meters, at the brewery, which give the government an absolute check on the amount of federal taxes due. Both the beer in the bottling house and in the draught department is thus metered which enables government authorities to get an accurate breakdown on the amount of package and keg sales. These meters were not in use in the preprohibition years, which probably accounts for the absence of statistics on draught and package production for that period.

The federal excise tax on beer and ale was \$5 per barrel until June 30, 1940. Then it was raised to \$6 per barrel, which was the rate until Nov. 1, 1942, when it was increased to \$7 per barrel. On April 1, 1944, another dollar was added to the tax rate as a wartime emergency measure. This made the tax rate \$8 per barrel, as contrasted with the rate of \$1 per barrel from 1902 to 1914. In addition, there were state taxes, varying in different states, and in some areas local taxes. There were no state taxes in the pre-prohibition years.

Taxes collected from beer by the United States government from April 7, 1933, to June 30, 1946, totalled \$4,773,609,186. State and local taxes for the same period totalled about \$1,675,000,000, making the combined revenue approximately \$6,448,609,186 since relegalization.

Taxes collected by the federal government continued to go into the general fund of the U.S. treasury. Beer taxes collected by the states were earmarked for specific purposes in some instances. In Georgia, for example, the \$3,343,445 collected in state beer excise taxes and licence fees for 1945 was used for the purchase of free textbooks in the public schools of the state, for the payment of teachers' salaries and for other school purposes. Many other states

also allocated a high percentage of revenue received from beer for educational, public welfare or public improvement purposes. (C. D. Ws.)

Great Britain and Europe.—Sharp breaks with established brewing practice might well have upset the traditional character of beer, but continued progress caused a gradual evolution in operational details, almost imperceptible in individual stages, but significant when viewed against a wider background. Plant developments, aimed at enhancing cleanliness and economy of working, included the increasing use of glass-lined tanks for beer storage and the investigation of a variety of alloys and plastic linings for fermenting vessels and other containers. Steam heating for hop boiling, as opposed to traditional fire heating, was still a matter for controversy, at least in top-fermentation breweries.

The full significance of brewing researches could be appreciated only in relation to studies in other fields, such as those on starch structure, the characters of the starch-splitting enzymes, the intricate biochemical changes in fermentation and the role of certain vitamins therein. Apart from studies on the behaviour of hop resins in the brewing process, hop investigations were mainly devoted to studying new varieties-with some success in Britain-and to controlling virus and fungus hop diseases. Renewed interest in barley followed the increasing use of the combine harvester, which necessitated wide departure from conventional treatments subsequent to cutting, with possibly a consequent deterioration of the malting quality of the grain; the dangers were well recognized, and plans for satisfactory solution were studied. Very striking was the study made in the Carlsberg laboratories of yeast reproduction, showing that spore formation is necessarily preceded by a sexual fusion, the later separation of individual spores involving a reduction division similar to that which precedes the formation of pollen grains in higher plants. Hybridization of yeasts was then possible. The concept of pure culture yeast thus demanded new definition, and the work gave promise of significance in those breweries where pure culture working was the rule. Work on the nitrogenous nutrition of yeast was of more general interest; a complete solution of this problem would permit more rigid control of yeast behaviour in brewery fermentations.

Biological stability of beer received much attention in Britain, while nonbiological stability was principally investigated by continental workers. The significant role of oxidative changes in many classes of beer deterioration was established, and the direct influence thereon of physicochemical properties of proteins again illustrated the value of initially academic researches in aiding the solution of practical problems. The immediately appealing properties of foaminess and flavour were not overlooked, and several workers developed interesting methods for at least assessing these characters in beers.

War conditions limited, and in some cases profoundly modified, the types and proportions of raw materials available, with further difficulties from limited manpower and distributional facilities and from increased taxation. Results in some countries were the reduction or even complete cessation of production, and in others a production maintained with difficulty of beers of reduced gravity, using, for example, unfamiliar blends of malt and reduced supplies of sugar. The influence of war conditions would pass with time, but events of 1939–46 appeared to emphasize the impossibility of having too great a knowledge of raw material properties and of the biochemistry of their

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Bricker, John William

Bricker (1893—), U.S. politician, was born Sept. 6, 1893, in Pleasant township, Madison county, Ohio. He was graduated from Ohio State university in 1916, and received his law degree from that institution in 1920. During World War I, he served as a first lieutenant in the army. After the war, he entered public service as solicitor for Grandview Heights, O., 1920–28, and was assistant attorney general of Ohio, 1923–27. He was a member of the public utilities commission, 1929–32 and served as attorney general for Ohio, 1933–37. Elected governor of Ohio on the Republican ticket for the 1939–41 term, he was twice re-elected to that office.

An outspoken foe of the New Deal, Bricker was selected as candidate for vice-president by the Republican national convention in 1944. He went down to defeat with his running mate, Gov. Thomas Dewey of New York, in the 1944 elections. Two years later, Bricker ran for senator of Ohio, scoring an impressive victory in the elections of Nov. 5, 1946. His name was mentioned prominently as presidential timber for 1948, and many Republican officials favoured Bricker over Dewey because of the former's greater acceptability to midwest Republicans. In domestic politics, Bricker described himself in his 1946 election campaigning as a "middle-of-the-roader." He said that he favoured minimum wage legislation, a permanent Fair Employment Practices commission and a federal anti-poll tax law. He opposed the Wagner-Taft-Ellender housing bill and urged elimination of all wartime controls, as well as the reduction of 1,000,000 employees from the federal pay roll. On foreign policy, he was of the opinion that the United States should neither divulge its atomic bomb "secrets" nor "appease" the "dictator powers."

Bridge, Contract

See CONTRACT BRIDGE.

Bridges, Harry

Bridges (1900—), U.S. labour leader, was born July 28, 1900, in Melbourne, Australia. The son of a prosperous real estate dealer, he left school and shipped to sea in 1920. After voyaging about the world as a merchant seaman, he settled in San Francisco in 1924 as a long-shoreman. An ardent trade unionist, he organized the majority of the city's longshoremen into a union by 1933. He led the successful docker's strike of 1934 and the following year formed the Maritime Federation of the Pacific, an association of several marine and waterfront unions. In June 1938, the longshoremen and affiliated unions joined the C.I.O., and Bridges was made regional director of the C.I.O. on the west coast.

His tremendous influence on the west coast aroused the antagonism of business groups, who launched a campaign (that soon became nationwide) denouncing the Australian-born labour leader as a communist and demanding his deportation. Bridges asked the department of justice for a ruling as to his status in Feb. 1938. Frances Perkins, then

secretary of labour, issued a warrant for his deportation on grounds that he was a communist, but in Jan. 1940, James M. Landis, special examiner in the case, ruled that while Bridges' aims were "energetically radical" there was no evidence that he sought to realize those aims by unconstitutional or undemocratic methods. A bill was then introduced in the house of representatives designed to deport Bridges to Australia, but the senate immigration committee blocked the measure in Aug. 1940.

Subsequently, a new examiner, Judge Charles Sears of New York, recommended Bridges' deportation. He was overruled by the board of immigration appeals, but in 1942, the board in turn was overruled by Attorney General Biddle. On June 18, 1945, the supreme court revoked the order. On Aug. 8, 1945, Bridges passed a preliminary U.S. citizenship test and on Sept. 17, 1945, became a U.S. citizen.

Bridges

Completion of the world's longest span, the Golden Gate bridge, in 1937 marked the first year of an eventful decade in the history of bridge engineering. In the period 1937 to 1946, new and unprecedented records of span length were established in five bridge types: suspension, continuous truss, continuous girder, reinforced concrete arch and reinforced concrete girder. A new bridge type, the Wichert truss, was introduced and developed. Notable spans of other types were built, including cantilever, steel arch, vertical lift, bascule and timber spans. (For other bridge types, including simple trusses, swing spans, masonry arches and plain concrete arches, no notable new spans were recorded, indicating that these bridge types had become largely outstripped or superseded.) Large pontoon bridges, both of concrete and of steel, involving novel design features, were built in several different parts of the world. All this record of new achievement was recorded despite the interruption of construction during World War II. As a matter of fact, the war stimulated the development of new and effective types of military bridges and established new records for speed in military bridge construction.

Perhaps the most eventful features in the bridge history of the decade were the spectacular failures of two notable bridges, the Tacoma Narrows bridge in 1940 and the Chester bridge (over the Mississippi river) in 1944, the one dramatically awakening the profession to the aerodynamic effect of wind and the other illustrating the aerostatic effect of the wind. Intensive research, both experimental and analytical, was initiated by these bridge catastrophes. Far greater destruction was caused during the decade by the military operations of World War II; thousands of bridges in Europe and Asia, including many historic and world-famous spans, were damaged or demolished.

Suspension Bridges.—In 1937 a new record for the world's longest span of any type was achieved with the completion of the Golden Gate bridge at San Francisco—a suspension bridge of 4,200 ft. span, with towers 746 ft. high and with two parallel wire cables 36½ in. in diameter. It was the final achievement of a lifelong ambition of Joseph B. Strauss, chief engineer of the project, who died 11 months later. The prior record was held by the George Washington bridge over the Hudson at New York city, completed in 1931, with a span of 3,500 ft. and with four cables 36 in. in diameter.

On July 1, 1940, the Tacoma Narrows bridge at Puget sound was completed and opened to traffic. Built at a cost of \$6,400,000, with a main span of 2,800 ft., it was the

Table I.—Notab	e Suspension Bridges Compl	eted during 19 Year of		
Bridge	Location	Completion	Span (ft.)	Rank
*Golden Gate	San Francisco	1937	4,200	1
†Narrows	Tacoma	1940	2,800	3 5
*Bronx-Whitestone	New York City	1939	2,300	
Lions Gate	Vancouver, B.C	1938	1,550	12
†Rodenkirchen	. Cologne, Rhine	1941	1,246	1 <i>7</i>
Deer Isle	Maine	1939	1,080	21
Beit (Zambezi)	. S. Rhodesia	1939	1,050	25
Peace river	Alaska	1943	930	34
Cuscatian	El Salvador	1942	820	40
Thousand Islands	U.S. & Canada	1938	800	44
†‡Reichsbruecke	Vienna	1937	792	46
Hardanger	Norway	1938	755	53
Victoria	Australia	1941	<i>55</i> 0	98
*Artistic bridge award.				

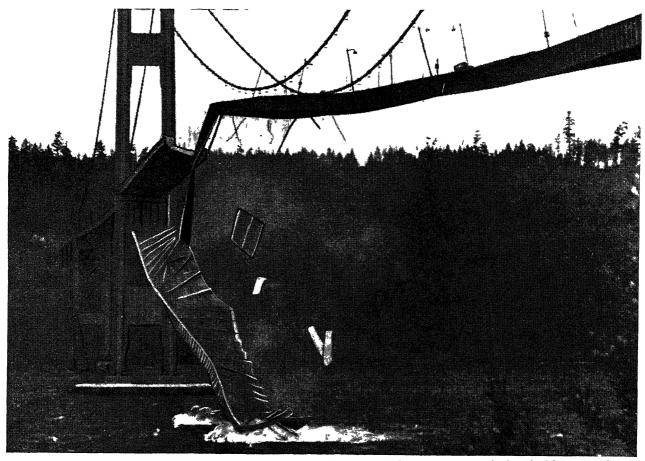
†Not standing (1946). ‡Eyebar chain bridge. hird longest spai

third longest span in the world. Four months later, on Nov. 7, 1940, the undulations of the bridge in a 42-mi. gale changed to twisting oscillations and increased to destructive amplitude (a double amplitude of 28 ft.) until the main span broke up, ripping loose from the cables and crashing into the waters of Puget sound. At first the failure was erroneously attributed to the narrow width of the bridge, only 1/75 of the span, and this popular fallacy persisted despite its scientific disproof. The true cause of the catastrophe was the extreme vertical and torsional flexibility of the span, yielding energy absorption entirely inadequate to counteract the inherent aerodynamic instability of the cross section. With the stiffening girders only 8 ft. deep, or only 1/350 of the span, the Tacoma bridge was by far the most flexible of all modern suspension bridges. The span was safely designed for all of the specified loads and forces, including the static effect of a wind pressure of 50 lb. per sq.ft. But it was destroyed by the dynamic effect of a wind pressure of only 5 lb. per sq.ft. The phenomenon is one of self-excited amplification of oscillations, drawing energy from a steady wind, until the oscillations (vertical or torsional) reach limiting or destructive amplitudes. Intensive investigations, including both mathematical analysis and model tests, were initiated by the Tacoma disaster, to guarantee the aerodynamic stability of future bridges.

In 1944 a number of vertical vibration recorders were installed on the Golden Gate bridge to measure and study the amplitudes and modes of the aerodynamic oscillations of the 4,200-ft. span. Vertical oscillations with amplitudes of more than five feet were measured on the 3,500-ft. span of the George Washington bridge.

The Bronx-Whitestone bridge spanning Long Island sound and connecting the boroughs of Bronx and Queens in New York city, with a main span of 2,300-ft.—fifth longest on record—was opened in May 1939. It was built in 23 months (the cables being constructed in the record time of two months), in time for the opening of the New York world's fair. Initial installations of centre stays, diagonal stays and friction brakes proved inadequate to eliminate disturbing aerodynamic oscillations. Additional stiffening was authorized in 1942, but wartime priorities caused postponement of this work. In 1945 a contract of more than \$1,300,000 was let for strengthening the bridge by adding stiffening trusses 14 ft. deep on top of the 11-ft. stiffening girders, together with other measures for curbing the aerodynamic oscillations.

The largest suspension bridge in the British empire, the Lions Gate bridge over the first Narrows of the harbour at Vancouver, B.C., with a main span of 1,550 ft., was completed in 1938. The postwar plans of British engineers, announced in 1945, included two new long



span suspension bridges, one over the Severn and one over the Firth of Forth, the former to have a main span of 3,200 ft., with towers 500 ft. high, representing an entry into a new order of span magnitude for British bridge building.

Despite the war, or as a military necessity, a new highway suspension bridge over the Rhine, the Cologne-Rodenkirchen bridge, was completed in 1941. Its main span of 1,246 ft. was the longest on the European continent and the longest self-anchored suspension span in the world, until the bridge was demolished by the Germans in 1945. The two companion suspension bridges over the Rhine (Cologne-Deutz, 1915, 605 ft.; Cologne-Muhlheim, 1929, 1,033 ft.) were respectively the second and fourth longest self-anchored suspension spans in the world.

The Deer Isle bridge on the coast of Maine, completed in 1939, is a suspension bridge of 1,080 ft. span, using prestressed rope-strand cables. Centre stays and diagonal stays were included to stiffen the span against aerodynamic effects. The bridge had to be built with limited funds. A difficult deepwater problem was solved by lowering completely assembled sheet-pile cofferdams prefabricated to fit the rock contours.

The Beit bridge over the Zambezi river at Churundu, Southern Rhodesia, a suspension bridge of 1,050 ft. span—longest span bridge in Africa—was also completed in 1939.

The Peace river bridge on the new Alaska highway, built in 1943 by the U.S. bureau of public roads, is a suspension bridge of 930 ft. main span. The concreting for the main piers had to be executed at temperatures 40° below zero. For the military emergency, the structure

Destruction of the Tacoma Narrows bridge, third longest single suspension bridge in the world, was caused by a windstorm Nov. 7, 1940, four months after the bridge was completed. There was no loss of life

was completed in a total construction time of eight months, amid ice and snow, wind and floods.

The Puente Cuscatlan over the Lempa river in El Salvador, completed in 1942 with a main span of 820 ft., became the longest suspension span in Central America and a vital link in the Pan-American highway. Each cable was made of 16 galvanized bridge strands of 1-15/16 in. diameter.

An important international crossing is the Thousand Islands bridge, joining the United States and Canada across the St. Lawrence river. This crossing, $8\frac{1}{2}$ mi. long, utilizes the islands as steppingstones to reduce the span lengths required, so that the total cost was only \$2,800,000. The U.S. crossing consists of a suspension bridge of 800-ft. main span. The Canadian crossing includes a 750-ft. suspension span, a continuous truss of two 300-ft. spans and a steel arch of 348-ft. span. The dedication of the bridge in 1938 by President Roosevelt and Prime Minister Mackenzie King featured the celebration of 100 years of peace and good will between the two nations.

In Vienna, the Reichsbruecke, an eyebar chain bridge of 792 ft. span over the Danube, was completed in 1937, but was destroyed during the war.

The suspension type became widely adopted for low-cost highway bridges in Norway. The largest of these, the Hardanger bridge with a main span of 755 ft., was completed in 1938.

The Sullivan-Hutsonville bridge over the Wabash river, between Indiana and Illinois, built in 1939, brought the number of self-anchored suspension bridges in the United

States to five. The main span is 350 ft., and each cable consists of nine 1½-in. galvanized rope-strands in open formation.

An aerial transporter bridge of suspension type, with a span of 885 ft., was constructed in 1944 over the Espiritu Santo river (one of the tributaries of the upper Amazon) in Bolivia. The wartime need for natural rubber made this crossing vital. The suspended transporter car carries a six-ton truck across the span in 1½ min., yet requires only a 20-h.p. motor. The complete bridge was fabricated in the United States and carried by mule and canoe far into the Bolivian jungle, where it was erected in eight weeks by unskilled native labour under the direction of U.S. engineers.

The construction of the Tor der Welt over the Elbe at Hamburg, an ambitious bridge project involving 500,000 tons of steel and including a 2,296-ft. suspension span and an 854-ft. plate girder span, was suspended at the outbreak of the war in 1939.

The historic Menai suspension bridge in Wales, 580 ft. span, built by Telford in 1826, was reconstructed in 1939 at a cost of £200,000. A wider roadway for modern traffic was provided with the replacement of the four old wrought-iron chains by two chains of high-tensile steel eyebars.

Cantilever Bridges.—The Howrah bridge spanning the Hooghly river at Calcutta, begun in 1938 and opened to traffic in 1943, has a 1,500-ft. main span. It thus became the third longest span cantilever bridge in the world (exceeded only by the 1,800-ft. Quebec span and the two 1,700-ft. spans of the Forth bridge). The bridge carries a 71-ft. roadway and two 15-ft. sidewalks. The river span was erected without falsework, using two travelling cranes moving on the upper chords and building out the struc-

U.S. army's Bailey bridge under construction over the Volturno river in Italy in 1944. The bridge, made of portable, prefabricated parts, was assembled on one shore and pushed across to the other. A sturdy bridge with two tiers of girders could be assembled in 24

ture before them to junction at midspan.

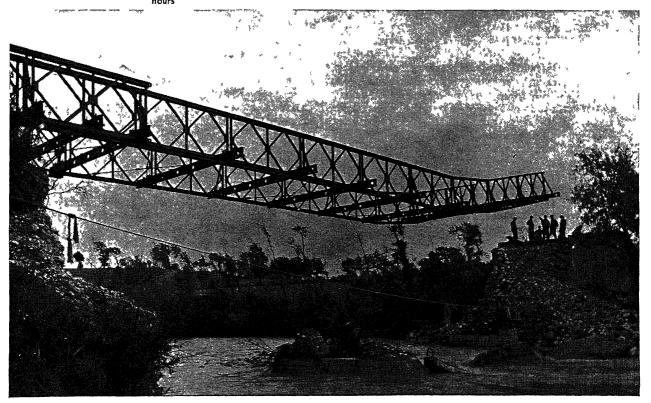
Bridge		Location	Year of Completion	Span (ft)	Rank
		India		1,500	3
		Queensland	1940	924	10
Natchez		Mississippi R		875	11
*Bluewater		Port Huron, Mich	1938	871	12
†Baton Rouge		Mississippi R	1940	848	13
Brownville, Neb.		Missouri river	1939	840	15
Greenville				840	16
		Ohio river	1938	800	24
Ludlow Ferry		Potomac river	1940	800	25
Memphis			est 1947	790	30
		Ohio river		750	33
		Port Arthur, Tex		680	44
		Rhode Island		640	56
†Pit river				630	57
		Columbia river	1941]	608	61
		Connecticut		540	72
Peoria			1941	536	73
*Artistic bridge awa †Railroad bridge.	ard.				

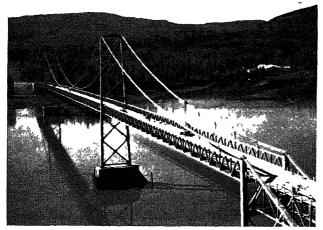
Table II - Notable Cantilever Bridges Completed during 1937-46

The Story bridge at Kangaroo point over the Brisbane river, Queensland, built 1935-40, with a cantilever span of 924 ft., is a government-owned toll bridge and the second longest span in Australia (exceeded only by the Sydney harbour bridge, a 1,650-ft. arch).

Three new cantilever bridges over the Mississippi river were completed in 1940: at Natchez, Miss., a highway bridge with two 875-ft. spans; at Baton Rouge, La., a railroad and highway bridge with two 848-ft. spans; and at Greenville, Miss., a highway bridge with 840-ft. main span. Other cantilever toll bridges completed in 1940 included one over the Ohio river at Owensboro, Ky., with a main span of 750 ft., and one at Jamestown, R.I., with a 640-ft. span.

The Bluewater bridge, an international highway bridge connecting Port Huron, Mich., and Sarnia, Ont, across the St. Clair river, is an arched cantilever of 871 ft. span, completed in 1938. Other highway cantilever bridges completed in 1938 included the Cairo (Ill.) bridge over the Ohio river, a multiple cantilever with 800-ft. principal





Peace river bridge on the Alaska highway in British Columbia, completed in 1943

span, and the Port Arthur-Orange bridge over the Neches river, Tex., with 680-ft. span.

A new interstate highway crossing over the Potomac river at Ludlow Ferry, Md., two miles long and including an 800-ft. cantilever span and 22 approach spans (trusses and girders) of the Wichert type, was completed in 1940. An unusual cantilever bridge was completed in 1941 to carry the Great Northern railway across the Columbia river at Kettle Falls, Wash. The relocation of the railroad crossing was made necessary by the construction of the Grand Coulee dam. The 608-ft. centre span was made the anchor, with each end span consisting of a cantilever arm and a suspended span.

The Pit river bridge in California, with a cantilever span of 630 ft. and the world's highest bridge piersconcrete piers up to 360 ft. tall-was completed in 1941. Carrying a railroad on the lower deck and a highway on the upper deck, the bridge was made necessary by the construction of the Shasta dam, located eight miles downstream on the Sacramento river and backing up water to a height of 400 ft.

The new high-level toll bridge (replacing a swing span) over the Thames river, connecting New London with Groton, Conn., a structure 5,926 ft. long with a central cantilever span of 540 ft., was opened to traffic in 1943. Balanced erection over the main piers was used, so as to require a minimum of falsework. It was built at a cost of \$6,000,000 to carry an express highway over the deep tidal estuary of the Thames river.

The largest bridge under construction in the United States in 1946 was the Memphis bridge over the Mississippi, a highway cantilever structure costing \$10,500,000 and having a channel span of 790 ft. For constructing the deep piers, the caissons were sunk by open dredging but were convertible to pneumatic working chambers if required. The caissons were floated out to the site and then sunk through willow mats previously placed to receive them.

The Cooper river bridge at Charleston, S.C., with cantilever spans of 1,050 and 640 ft., built in 1929, had a section of its approach spans wrecked by a ship collision in 1946. For the emergency temporary repairs, resourceful use was made of the Bailey trusses developed and applied in World War II for military bridging.

Steel Arch Bridges.-The Rainbow bridge at Niagara falls, a publicly owned toll bridge replacing the old privately owned arch bridge (the "Honeymoon bridge") wrecked by an ice jam in 1938, was completed in 1941,

with a 950-ft. steel arch span. The new arch was erected with the aid of a cable tieback system, employing the wire rope strands originally used as the temporary footbridge ropes for the Golden Gate bridge. The Rainbow bridge established a new record as the longest arch span with fixed ends; the prior record for hingeless steel arches

Table III.—Notab'e Steel Arch Bridges Completed during 1937-46

Bridge			Location	Year of Completion	Span (ft.)	Rank
*†Rainbow			Niagara Falls	1941	950	5
			Waal river, Netherlands .		790	8
*‡Middletown			Connecticut river	1938	600	19
			Denmark		590	24
‡St. Georges			Delaware	1941	540	34
‡Rock Island			Mississippi R	1940	5391	35
Orford		٠	Connecticut R	1 <i>937</i>	425	61
*Brattleboro			Connecticut R	193 <i>7</i>	425	62
*Artistic bridg			40)			

Tied arch.

and for arches of the plate girder type was held by the Henry Hudson bridge over the Harlem river, New York .city, with 800-ft. span. One month after the Henry Hudson bridge was opened (Dec. 1936), the addition of an upper deck was authorized to double the traffic capacity, as anticipated by the engineers, and this work was completed early in 1938.

The bridge at Nijmegen (Netherlands) over the Waal river, a two-hinged steel arch of 790-ft. span (longest span steel arch in Europe), was completed during 1946. An ingenious erection method was used for raising the segments of the arch truss, utilizing for temporary support the trusses fabricated for another bridge.

The Middletown bridge over the Connecticut river, consisting of two tied arches of 600 ft. span, was completed in 1938. The foundations for this bridge were sunk by the use of rotating caissons in the form of steel cylinders with toothed cutting edge to penetrate the underlying material, including boulders. A major work completed in 1937 was the Storstrom bridge, built for the Danish state railways, with two-hinged through arches of steel of 460-590-460 ft. in the three central spans. The bridge, two miles in total length, has highway and railway side by side on its deck.

A highway bridge over the Chesapeake and Delaware canal at St. Georges, Del., a steel tied arch of 540-ft. span, for which the tie also acts as a stiffening girder, was built in 1940-41. It replaced a vertical lift bridge wrecked by a ship collision in 1939.

Other steel arch bridges completed during the decade included the following: bridge over the Mississippi river at Rock Island, Ill., five tied-arch steel spans, two at 539 ft. (1940); two bridges of similar design and the same span length of 425 ft. at Orford and Brattleboro, both spanning the Connecticut river between New Hampshire and Vermont (1937); bridge over the Seine at Neuilly, France, steel arch span of 269 ft., longest welded-arch span in the world (1945). The latter structure replaced Jean R. Perronet's famous bridge of stone arches built in 1768-80.

Reinforced Concrete Arch Bridges.-In 1943, all prior records for reinforced concrete spans were eclipsed with the completion of the world's greatest concrete arch, the Sando bridge over the Angerman river in Sweden, with a record-breaking span length of 866 ft. During erection, in 1939, the falsework centring collapsed, with a loss of 18 lives, in the initial stage of the pouring of the concrete. With a new design of centring to assure stability, following scientific studies and tests, the bold span was successfully accomplished.

The world's second longest span of reinforced concrete, the arch at Esla, Spain, with a span of 645 ft., was completed in 1940. The construction was in an advanced stage, scheduled to be completed in 1935, when the Spanish Civil War interrupted the work for five years. The prior record for concrete arches had been held for 11 years by the Plougastel bridge over the Elorn river at Brest, France, with three spans of 612 ft., built in 1929 as a combination railway and highway bridge. One span of this notable structure was destroyed by the Germans in 1944.

Table IV—Notable Reinforced Concrete Arch Bridges Completed during 1937-46

Bridge			Location	Year of Completion	Span (ft.)	Rank
Sando			Sweden	. 1943	866	1
Esla			Spain	. 1940	645	2
			France		528	5
Svinesund			Sweden	. 1942	509	6
Berne			Switzerland	. 1940	492	7
Gera-Jena			Germany	. 1938	452	10
Ed (Angerman river)			Sweden	. 1939	398	18
Tarendo			Sweden		394	19
Lappeasuando			Sweden	. –	394	20
Ume river			Sweden		348	25
Bergsviken	٠		Sweden	,	249	59
Russian gulch			California	. 1945	240	63
Waterioo			London	. 1942	238	64
Nehalem river			Oregon	. 1939	231	70
Aliso street	•	•	Los Āngeles	. 1943	222	77

The fourth, fifth and sixth longest spans of reinforced concrete arches on record in 1946 were the Traneberg bridge in Sweden with a span of 593 ft., built in 1935; the La Roche-Guyon bridge in France with a span of 528 ft., built in 1937; and the Idefjorden bridge at Svinesund, Sweden, with a span of 509 ft., built in 1942. The seventh in rank of span length was the Lorraine bridge at Berne, Switzerland, a reinforced concrete arch span of 492 ft., completed in 1940. The structure, one mile long, was built by the Swiss federal railways at a cost of 14,000,000 Swiss francs, to provide a four track railroad crossing over the Aare river.

The reinforced concrete arch of 398-ft. span over the Angerman river at Ed, Sweden, built in 1939, typified a new type of arch construction, introduced by O. F. Nielsen, using inclined tension rods for suspending the roadway, the same tension rods serving to brace the arch rib so as to permit more slender construction. This economical type of reinforced concrete arch was used in 1933 for the Castelmoron bridge in France with a span of 470 ft. Similar reinforced concrete arches with suspended roadway were built in Sweden at Tarendo and at Lappeasuando, both over the Kalyx river (394-ft. span), at Hamptjarnskammen over the Ume river (348-ft. span) and at Bergsviken over the Pite river (249-ft. span).

In 1943 the city of Los Angeles completed a \$5,000,000 viaduct project, crossing the Los Angeles river at Aliso street. The channel span is a 222-ft. reinforced concrete arch with six ribs.

Continuous Truss Bridges.—The Sciotoville bridge over the Ohio River, a two-track railroad structure with two spans of 775 ft., completed in 1917, established the continuous truss type in modern bridge practice and held the record as the world's longest span of this type for 18 years until a new record was established by a highway bridge over the Rhine at Duisburg, with a main span of 839 ft., built in 1935 and blown up by the Germans in

In 1942 a new record was again set by the interstate highway bridge across the Mississippi river at Dubuque, Ia.—a continuous through truss of novel design, with 845-ft. central span in the form of a tied arch, and 347-ft. side spans.

The world's third longest span of the continuous truss type in 1946 was another Mississippi river crossing, the St. Louis county bridge, below St. Louis, completed in 1944, with a centre span of 804 ft., flanked by 670-ft. side spans. In 1942 another continuous truss highway bridge was completed over the Mississippi river at Chester, Ill., with two spans of 670 ft. Two years later this bridge was blown off its piers and fell into the river during a violent windstorm. The trusses, 1,340 ft. long and 100 ft. deep over the piers, were spaced only 28½ ft. centre to centre. This bridge failure, like that of the Tay bridge in 1879, was an example of aerostatic instability. It directed the attention of bridge designers once more to the possibility of wind uplift, added to direct horizontal pressure, as well as to the necessity for providing adequate anchoring of bridge spans to piers to prevent sliding, uplift and overturning.

Table V.—Notable Continuous Truss Bridges Completed during 1937-46

Bridge	Location			Year of Completion	Span (ft.)	Rank
Dubuque	. Mississippi R.			1942	845	1
St. Louis county	. Mississippi R.			1944	804	3
*Chester	. Mississippi R.			1942	670	9
†Homestead				1937	5331/2	16
*Horthy	. Budapest			1937	500´	21
†‡Havre de Grace				1940	456	24
Clay's Ferry, Ky				1942	448	26
Black river				1940	400	31
*Not standing (1946). †Wichert type. ‡Artistic bridge award.						

A new form of continuous bridge developed and introduced in 1937-41, was the Wichert continuous type, distinguished by the use of linked members forming open quadrilaterals over the intermediate piers. This construction makes the structure statically determinate, so as to be independent of the possible settlement of the supports on yielding foundations. At the same time the economic advantages of the rigid continuous type are retained.

The first bridge of the Wichert continuous type, the Pittsburgh-Homestead bridge over the Monongahela river, was completed in 1937. The 3,100-ft. crossing was constructed of ten semicontinuous arched trusses, including two spans of 533½ ft. Other Wichert-type bridges built later included one over the Susquehanna river at Havre de Grace, Md. (1940), 7,618 ft. long, with 36 Wichert truss and girder spans (longest truss span 456 ft.); one over the Potomac river at Ludlow Ferry, Md. (1941), two miles long, including an 800-ft. cantilever span and 22 Wichert approach spans (longest truss span 350 ft., longest girder span 162 ft.); one over the Potomac river at Hancock, Md. (1939), with 20 Wichert truss and girder spans; and the Wilmot street bridge at Pittsburgh (1940) with three Wichert truss spans (longest 360 ft.).

The Wichert-type bridge built in 1940 over the Susquehanna river at Havre de Grace supplanted the old iron truss bridge near by. This historic structure, after outliving its usefulness as a railroad bridge, was sold in 1910 for \$1, was converted into a highway toll bridge, earned millions of dollars in tolls, was double-decked in 1927, was made toll-free in 1928, and in 1942 was taken down to yield 3,495 tons of scrap metal for the U.S.'s war drive.

Continuous Plate Girder Bridges.—In the United States three successive records for span-length of continuous plate girder bridges were established in a brief period: The Thomas A. Edison bridge over the Raritan river at Perth Amboy, N.J., completed in 1940, with a main span of 250 ft.; the Lakefront bridge at Cleveland, completed the same year, with a main span of 271 ft.; and the Charter Oak bridge over the Connecticut river at Hartford, completed in 1942, with a central span of 300 ft.,

the longest continuous girder span in the U.S.

Table VI.—Notable Continuous Plate Girder Bridges Completed during 1937-46

Bridge	location	Year of	Span (ft.)	Pank
ligolstadt	Elbe river Danube Oder river Hartford Cleveland Perth Amboy, N.J. Ohio Berlin Stratford, Conn. Alabama Germany Frankfort, Ky.	Completion 1939 1938 1938 1937 1942 1940 1940 1941 1937 1940 1943 1937	(ft.) 591 383 378 300 271 250 236 228 224 210 203 200	Rank 1 4 5 11 12 14 17 19 20 22 26 27 29
Salt river	West Point, Ky Los Angeles Pomerania	1943 1943 1939 1937 1938 1941 1940	200 192½ 177 172 162 154 150	31 34 37 38 41 45 46

Still bolder span lengths of continuous plate girder bridges were attained during the same period in Germany. A bridge at Mangfall (1935) had a plate girder span of 354 ft.; a bridge crossing the Elbe (1938) on the Berlin-Halle express highway had a plate girder span of 383 ft.; and a bridge over the Rhine at Frankenthal (under construction in 1939) had a plate girder span of 591 ft. Another bridge (unidentified) was reported to have a girder span of 623 ft., which would make it the longest plate girder span in the world. And the ambitious bridge project at Hamburg, commenced in 1938 and interrupted by the war in 1939, included a proposed continuous plate girder span of 854 ft.

Vertical Lift Bridges.—Completed in 1937, with a span of 540 ft., the Marine parkway bridge between Brooklyn and Rockaway was still, in 1946, the second-longest lift span, exceeded in span length by only four feet in the world's longest lift span, the 544-ft. span of the railroad bridge over Cape Cod canal, completed in 1935. The roadway of the Marine parkway bridge's lift span was made of open grid construction, to reduce weight. Continuous truss approach spans of tapering depth were added for artistic composition.

Table VII.—Notable Vertical Lift Bridges Completed During 1937-46

Bridge				Location	Year of Completion	Span (ft.)	Rank
*Marine parkway				New York	193 7	540	2
Harry S. Truman				Kansas City	1945	420	2 5
*St. Johns river .				Jacksonville, Fla	1941	386	8
*Passaic river .				New Jersey	1941	3321/2	12
Torrence avenue				Chicago	193 7	276	28
St. Johns river .				Fredericton, N.B	1938	260	34
Neches river .				Beaumont, Tex	1941	245	38
Cuyahoga river				Cleveland	1940	240	40
Reserve basin .				Philadelphia	1942	240	41
†Pennsylvania R.R.				Passaic river	193 7	230	45
West Third street				Cleveland	1940	225	49
†Piscataqua river				Portsmouth, N.H	1941	224	50
Cuyahoga river				Cleveland	1940	220	52
*Artistic bridge	a١	٧a	rd.	†Railro	d bridge.		

The President Harry S. Truman bridge, carrying a single-track railroad over the Missouri river near Kansas City, and including a 420-ft. vertical lift span, was completed in 1945.

Bascule Spans.—The world's longest double-leaf bascule span, 336 ft., in the Canadian Pacific railroad bridge over the ship canal at Sault Ste. Marie, built in 1914, collapsed in 1941 under the weight of a passing locomotive. A failure of the interlocking signal system was responsible. In the wartime emergency the span was promptly repaired and reopened to railroad traffic in 1942.

The Erie avenue bridge over the Black river at Lorain, O., completed in 1940, with a double-leaf bascule span of

333 ft., became the second longest in the world. In Chicago, the north State street double-leaf trunnion bascule bridge over the Chicago river (construction, interrupted by the war, was resumed in 1946) was planned for a 245-ft. span, 108 ft. wide, each leaf weighing 4,200 tons. Two other double-leaf bascule bridges on the Lake Shore drive, Chicago, were completed in 1937 with spans of 264 ft. and 220 ft., respectively. The Neches river bridge at Beaumont, Tex., completed in 1941, with a span of 230 ft., became the third longest single-leaf bascule in the world (exceeded by the south Chicago bridge (1913), 235 ft., and the Sixteenth street bridge Chicago (1919), 260 ft.

Table VIII.—Notable Bascule Spans Completed during 1937-46

			Location	Completion	(ft.)	Rank
· ·	rd.	:	Chicago	. 1937 . 1946 . 1941	333 264 245 230† 220	2 7 13 17 26
	 	· · ·		Lorain, O	Location Completion Lorain, O	Location Completion (ft.)

Concrete Girder Bridges.—A record-breaking concrete girder span of 256 ft. was built in 1938 over the Seine at Villeneuve, near Paris. The Seine crossing at Bry-sur-Marne, a concrete cantilever of 186-ft. span, also completed in 1938, was blown up by French army engineers in 1940. In 1941 it was replaced by a temporary suspension bridge, and rebuilding of the original bridge was begun in 1945, involving the raising of the suspended section of the main span from the bottom of the river.

Construction of the new Waterloo bridge over the Thames in London, England, commenced in 1937 and continued despite the war, was completed in 1942. It consists of five spans of 238 ft., of cellular construction, with piers and spans of reinforced concrete faced with granite and Portland stone. The bridge deck, providing six lanes of traffic, is 80 ft. wide. It replaced the old Waterloo bridge, a famous structure of masonry arches built by John Rennie in 1811–17, which had a roadway width of only 27½ ft.

European engineers recorded outstanding pioneer work in the development of prestressed concrete. To replace bridges destroyed in France during the war, E. Freyssinet built a number of prestressed concrete beam spans of more than 160 ft., with girders only 61/2 ft. deep. The prestressing principle was also used in a highway bridge built at Aue, Germany, in 1936, using a concrete cantilever girder 392 ft. long, with a centre span of 226 ft. A novel feature in this structure was that the adjustable steel tension chord, used to prestress the girders, was not embedded in the concrete.

A bridge at Santa Paula, Calif., a cellular girder of reinforced concrete, with a clear span of 120 ft., was completed in 1940. Its depth of 2 ft. 9 in. at mid-span was a new record for slenderness of such spans.

Timber Bridges.—In 1941 a timber bridge was built at Kiskatinaw, Alaska, with a span of 195 ft., believed to be the second-longest timber span standing. (A 380-ft. timber span was built at Coburg, Ore., in 1926.)

During World War II, emphasis was placed on timber construction, because of the shortage of steel caused by war requirements. A number of timber bridges were built by state highway departments. In 1943 a highway bridge with six 129-ft. truss spans of timber with steel gusset plates was constructed over a channel of the Ohio river near Pittsburgh. This bridge illustrated the use of timber with a small amount of steel to produce a semi-permanent structure.

Pontoon Bridges.—A concrete pontoon bridge across Lake Washington in Seattle, built 1938–40 by the State of Washington Toll Bridge authority at a cost of \$8,850,000, had the floating portion 6,560 ft. long made up of 24 precast cellular reinforced concrete pontoons, 117 to 378 ft. long, 59 ft. wide and 14½ ft. deep, floating 7 ft. out of water, with a central 202-ft. opening for ships provided by a sliding, indrawn floating span.

Another concrete pontoon bridge, completed in 1939 across the Derwent river at Hobart, Tasmania, was novel in design, forming a three-hinged horizontal arch, with the crown of the arch upstream. The arching in plan dispensed with cable anchorages. The entire 3,165-ft. length of the floating arch was designed to move freely up and down with the 8-ft. tides. Each of the two arch segments was made up of 12 cellular pontoons, each 132 ft. long, rigidly united by welding the projecting reinforcement and then concreting. A 30-ft. roadway, a sidewalk and space for a water main were provided on the 40-ft. width. A vertical lift span in the approach was included to provide a clear channel 180 ft. wide and 150 ft. high for navigation.

At Istanbul, Turkey, a steel pontoon bridge 1,500 ft. long, spanning the Golden Horn, was completed in 1939. The 24 pontoons, of steel box construction, 82 ft. wide, 30 ft. long and 12 ft. deep, were spaced 30 ft. apart, supporting a rigid-frame steel superstructure carrying the concrete deck, 52 ft. wide. Passage of vessels was provided for by construction of a centre section of four pontoons moved by tugs and swinging open like a gate.

Military Bridges.—Probably the outstanding contribution of World War II in the development of military bridges was the Bailey bridge, invented by D. C. Bailey of the British ministry of supplies. This remarkably efficient military bridge was designed for assembly from standard units. The basic unit during the war was a 10ft.-long section including trusses, floor beams, stringers and fittings. The capacity of the bridge was increased by adding truss units, both inside and on top of the original trusses, to a maximum of three high, three wide. All connections were bolted, permitting noiseless assembly and erection under cover of darkness. The span was assembled on land and then pushed forward on rollers. A 100-ft. span strong enough to carry 30-ton tanks could be erected in three hours. The Bailey assemblies were used for spans exceeding 240 ft. without a central support.

A spectacular Bailey bridge was built by a U.S. combat battalion in Dec. 1944 to span a deep cut over the Albert canal in Belgium. Bailey truss panels were used to form the 52-ft.-high piers as well as the superstructure with span lengths of 151-152-121-ft. The Unit Construction Railway Truss, developed by the British early in the war, was a precision-built Pratt-type truss that could be quickly erected as a through or deck bridge in span lengths up to 85 ft.

The U.S. army developed the Portable Scissors bridge as a mobile self-launching bridge of 80-ft. span for vehicles and tanks weighing up to 35 tons. The bridge was a 13-ton aluminum girder assembly, hinged at the centre. It was carried in folded horizontal position on a trailer, from which it was mechanically launched by first maising the assembly to a vertical position and then spreading the scissors until the far end rested on the opposite shore. The 80-ft. span could be installed in 15 to 30 min. by six men.

Under security censorship during the war, U.S. engineers developed the Demountable V-type bridge for the speedy replacement of demolished railroad bridges at the

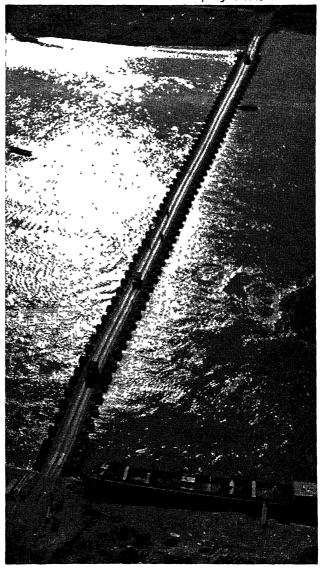
battlefront. Made in standard 10-ft. panel lengths, it could be quickly erected either as a deck or through structure, either square-ended or skewed, of 40-ft. to 90-ft. span for railroad equipment and up to 240-ft. span for highway use.

A development in floating bridges by U.S. army engineers during the war was the M-4 or Division army bridge, made of structural aluminum and designed for vehicle loads up to 50 tons, a greater load capacity than in any previous floating bridge.

For pneumatic pontoons, the M-2 treadway bridge was the heaviest designed during the war and was good for vehicle loads up to 45 tons. The light open-grid treadways, $45\frac{1}{2}$ in. wide, were supported on steel saddles on pneumatic pontoons of rubberized canvas spaced 12 ft. on centres.

For the invasion of Germany in 1945, U.S. army engineers built 14 fixed bridges across the Rhine (5 railroad and 9 highway crossings) and more than 40 floating bridges spanning the river. The railroad bridge over the Rhine at Mainz, dedicated (1945) as the Franklin D.

Bridging the Rhine at Linz, Germany, this road built of pontoon rafts bore a steady roll of trucks and supplies to U.S. 1st army forces east of the river in the spring of 1945





Roosevelt Memorial bridge, 2,200 ft. long, was built in 9 days and 22 hr., breaking Julius Caesar's record of bridging the river in ten days some 2,000 years ago. The record was again broken when another regiment of U.S. engineers built a 2,800-ft. railroad crossing over the Rhine at Duisburg in 6 days and 15 hr. (April 1945).

The longest-span military bridge on record—a suspension bridge of 420-ft. span and 40-ton capacity—was built in 1945 by U.S. army engineers across the Shweli river on the Stilwell (Ledo) highway near the China-Burma border. This type of military suspension bridge was standardized. From the standard equipment, an engineer company could quickly build bridges of any span from 220 ft. to 420 ft., in 20-ft. increments.

Bridge Destruction During World War II.—All of the German bridges over the Rhine, including many world-famous spans, were blown up by the Germans to retard the Allied invasion in 1945. A bridge that made military history, speeding the end of World War II, was the Ludendorff bridge over the Rhine at Remagen, a railroad bridge of 512-ft. main span in the form of a tied arch continuous with 277-ft. side spans. Its quick capture by advance patrols of the U.S. army on March 7, 1945, only ten minutes before the time set for its planned demolition by the Germans, enabled armoured troops and supplies to be poured across the Rhine in a steady stream for ten days before the weakened bridge collapsed. This unexpected crossing of the Rhine shattered the morale of the Germans and accelerated their early surrender.

All of the bridges over the Albert canal in Belgium, including the world's outstanding aggregation of Vierendeel (rigid-joint) truss bridges, were destroyed, mostly by the Belgians themselves, during the German invasion in 1940. One of the bridges, at Hasselt, was wrecked and rebuilt 14 times in the changing fortunes of war. About 5,000 bridges in France were wrecked during

Ludendorff bridge at Remagen after its capture on March 7, 1945, showing U.S. Ist army troops crossing the Rhine into Germany. Failure of the Germans to destroy the bridge gave U.S. forces their first foothold east of the Rhine

the war, many of them a second time after reconstruction in 1943. Fortunately the two dozen beautiful and historic bridges crossing the Seine within the city of Paris were spared from any war damage, but bombs and demolition took their toll of nearly all the bridges outside of Paris. The beautiful and famous bridges over the Danube at Budapest were also destroyed.

Table IX.—World's Longest Spans, 1946

T	D		Date of	Span
Type	Bridge	Location	Completion	(ft.)
Cable suspension	*Golden Gate	San Francisco .	. 1937	4.200
Transporter	†Sky Ride	Chicago	. 1933	1.850
Cantilever	‡Quebec	Canada	. 1917	1,800
Steel arch	*Kill van Kull	New York	. 1931	1.652
Eyebar suspension	‡Florianopolis	Brazil	. 1926	1,114
Concrete arch	Sando	Sweden	. 1943	866
Continuous truss	Dubuque	Mississippi R	. 1942	845
Simple truss				720
Continuous girder				591
Vertical lift	‡Cape Cod canal .	Massachusetts .	. 1935	544
Wichert truss	Homestead	Pittsburgh	. 1937	5331
Swing span	‡Fort Madison	Mississippi R	. 1927	525
Tubular girder	‡Britannia	Menai strait .	. 1850	460
Timber span	†Wettingen	Switzerland	. 1 <i>75</i> 8	390
Bascule	‡Sault Ste. Marie .	Michigan	. 1914	336
Masonry arch	Plauen	Saxony	. 1903	295
Single-leaf bascule .	‡Sixteenth street	Chicago	. 1919	260
Concrete girder	Villeneuve	Seine river	. 1938	256
*Artistic bridge gwg	rd			

*Artistic bridge award. †Not standing, 1946. ‡Railroad bridge.

Damage to bridges by attack from the air was comparatively small. The Germans dropped more than 1,600 bombs from planes over the world-famous Forth bridge in Scotland without scoring a single hit. Despite the many thousands of bombs dropped by the Germans in the air raids over London, not a single bridge over the Thames was seriously damaged, whereas one of the vehicular tunnels under the Thames was wrecked by an aerial bomb. (See also Roads and Highways.)

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Briquettes, Fuel

See FUEL BRIQUETTES.

British Borneo

See Borneo.

British Columbia

British Columbia is the third largest and most westerly of the nine provinces comprising the dominion of Canada. The crown colonies of Vancouver island (1849) and of British Columbia (1858), after uniting in 1866, became the sixth province to enter the Canadian confederation on July 20, 1871. Occupying an area of 366,255 sq.mi., of which 6,976 sq.mi. are water, and lying for the most part between the 49th and 60th parallels of north latitude, the province is bounded on the west by the Pacific ocean, on the south by the states of Washington and Montana, on the east by the province of Alberta, and on the north by Alaska, the Yukon and the Northwest Territories.

The population at the census of 1941 numbered 817,861 persons; approximately 70% (599,783) of whom were residents of the southwestern corner of the province—the lower Fraser valley and Vancouver island regions. The principal ports of Greater Vancouver (1941, 351,491), Greater Victoria (75,218)—the capital, and New Westminster (21,967) are located in the southwest corner. English was the mother tongue for the majority (641,419), but Japanese (21,602), Chinese (18,386), German (15,903), Russian (12,548), Swedish (11,375), French (11,058), Norwegian (10,242) and Italian (9,204) were among the other languages spoken.

Over the decade 1937–46, according to official intercensal estimates, the population steadily increased: 1937, 759,000; 1938, 775,000; 1939, 792,000; 1940, 805,000; 1941 census, 817,861; 1942, 870,000; 1943, 900,000; 1944, 932,000; 1945, 949,000; 1946, 960,000 (estimated).

During the decade 1937-46, the lieutenant governors of British Columbia were as follows:

Eric Werge Hamber (April 29, 1936–Aug. 29, 1941); Lieutenant Colonel William Culham Woodward (after Aug. 29, 1941).

Elections and Ministries.—Three general elections were held during the decade—in 1937, 1941 and 1945. In the election of June 1, 1937, the Liberal government of T. D. Pattullo was returned to power; standing of the various parties in the 19th legislative assembly was: Liberal, 31; Conservative, 8; Co-operative Commonwealth Federation, 7; Independent, 1; Labour 1. Members of the 22nd Ministry (1933–41) and their portfolios were: T. D. Pattullo, premier and president of the executive council (Nov. 15, 1933–Dec. 9, 1941), attorney-general (April 5, 1937–July 5, 1937; Nov. 24, 1941–Dec. 9, 1941), railways (Nov. 15, 1933–Dec. 23, 1937), public works (Sept. 27, 1939–Dec. 5, 1939), finance and education (Nov. 18, 1941–Dec. 9, 1941); John Hart, finance (Nov. 15, 1933–Nov. 17, 1941), indus-

tries (Nov. 15, 1933-Dec. 23, 1937); G. M. Weir, provincial secretary and education (Nov. 15, 1933-Nov. 17, 1941); G. McG. Sloan, attorney-general (Nov. 15, 1933-April 5, 1937); G. S. Wismer, attorney-general (July 5, 1937-Nov. 14, 1941); A. W. Gray, lands and municipalities (Nov. 15, 1933-Dec. 9, 1941); K. C. MacDonald, agriculture (Nov. 15, 1933-Nov. 25, 1941); G. S. Pearson, labour and fisheries (Nov. 15, 1933-Nov. 14, 1941), mines (Nov. 15, 1933-Dec. 23, 1937), railways (Dec. 23, 1937-Dec. 5, 1939); F. M. MacPherson, public works (Nov. 15, 1933-Sept. 27, 1939); C. S. Leary, public works and railways (Dec. 5, 1939–Nov. 14, 1941), trade and industry and mines (Nov. 14, 1941-Dec. 9, 1941); W. J. Asselstine, trade and industry and mines (Dec. 23, 1937-Nov. 14, 1941), labour and fisheries (Nov. 14, 1941-Dec. 9, 1941); N. W. Whittaker, attorneygeneral (Nov. 14, 1941-Nov. 19, 1941); T. King, public works and railways (Nov. 15, 1941-Dec. 9, 1941); F. Putman, agriculture (Nov. 26, 1941-Dec. 9, 1941).

In the election of Oct. 21, 1941, the Liberal administration failed to obtain a majority in the 20th legislative assembly; there were 21 Liberals elected, 14 Co-operative Commonwealth Federationists, 12 Conservatives, and 1 Independent Labourite. Favouring a coalition government and dissatisfied with Premier Pattullo's decision to form a new minority Liberal government, four members of the cabinet resigned. Unable to secure support for his policies, Pattullo resigned as leader of the Liberal party Dec. 2, 1941, and when the legislative assembly convened Dec. 4, he announced the resignation of his cabinet. No legislation was introduced during the single day session of the assembly, which was adjourned until Jan. 8, 1942. Called by Lieutenant Governor W. C. Woodward to form a government, the new provincial Liberal leader, John Hart, announced the formation of a Liberal and Conservative coalition government Dec. 10, indicating that the C.C.F. members had declined an invitation to join in the formation of a union government. The new ministry, the 23rd, comprising eight ministers, included R. L. Maitland, leader of the provincial Conservative party, and two other Conservatives-R. W. Bruhn and H. Anscomb; the remaining five portfolios were held by Liberals. The C.C.F. members of the legislative assembly, under the leadership of Harold E. Winch, constituted the official opposition.

In the election of Oct. 29, 1945, the Coalition government, headed by Premier John Hart (Liberal) and Attorney-General R. L. Maitland (Conservative) was returned to office. Standing of the various parties in the 21st legislative assembly was: Coalition members 37; C.C.F., 10; and Labour, 1. The Co-operative Commonwealth Federation, headed by Harold E. Winch, again became the official opposition. Members of the 23rd ministry (formed 1941) and their portfolios were: John Hart, premier and president of the executive council (after Dec. 9, 1941), finance (Dec. 9, 1941-April 12, 1946), lands (May 11, 1944-Nov. 8, 1944); R. L. Maitland, attorney-general (Dec. 10, 1941-April 4, 1946); G. S. Pearson, provincial secretary, labour and fisheries (after Dec. 10, 1941); K. C. Mac-Donald, agriculture (Dec. 10, 1941-Nov. 19, 1945); A. W. Gray, lands and municipal affairs (Dec. 10, 1941-May 7, 1944); H. Anscomb, mines, trade and industry (Dec. 10, 1941-Oct. 28, 1942), public works and railways (Sept. 15, 1942-April 12, 1946), municipal affairs (May 11, 1944-April 12, 1946), finance (after April 12, 1946); R. W. Bruhn, public works, and railways (Dec. 10, 1941-Aug. 30, 1942); H. G. T. Perry, education (Dec. 10, 1941-Nov.

19, 1945); E. C. Carson, mines, trade and industry (Oct. 28, 1942–April 12, 1946), public works (after April 12, 1946); E. T. Kenney, lands and forests (after Nov. 8, 1944); G. M. Weir, education (after Nov. 19, 1945); F. Putman, agriculture (after Nov. 21, 1945); G. S. Wismer, attorney-general (after April 4, 1946); R. C. MacDonald, mines and municipal affairs (after April 12, 1946); and L. H. Eyres, railways, trade and industry (after April 12, 1946).

Legislation.-During Pattullo's premiership, the 19th legislative assembly held five sessions. Legislation enacted during the first session (Oct. 26, 1937-Dec. 10, 1937) included the following: the Coal and Petroleum Products Control Board act empowered a three-man board to license persons entering the coal or petroleum industry and to fix wholesale and retail prices for their products; the Industrial Conciliation and Arbitration act established formal procedure for the appointment of a conciliation commissioner and, if conciliation failed, subsequently for a three-man board of arbitration in the event of an industrial dispute. Other statutes empowered the minister of agriculture to establish grades for beef carcasses as well as for fruit, vegetables or honey. The Department of Trade and Industry act established a new department comprised of the bureau of economics and statistics, the bureau of trade extension, and the bureau of industrial and tourist development. The Commodities Retail Sales act was passed to prevent commodities from being sold at a price less than the laid-down cost to the retailer, while the Food Products Minimum Loss act prohibited a retailer from selling food products (excluding fresh fruit and vegetables or highly perishable goods) at a price less than 5% above the laid-down retail cost. Other legislation widened the coverage of the mothers' allowances, authorized the Provincial government to establish infirmaries for persons needing institutional care, and covered the administration of the industrial schools for girls and for boys.

Statutes passed during the second session of the 19th parliament (Oct. 25, 1938–Dec. 9, 1938) included the Credit Unions act, which provided for the incorporation and regulation of credit unions; a series of revisions consolidating changes in the mineral laws of the province; the Municipal Improvements Assistance Enabling act, which authorized municipalities to borrow from the dominion government; extensive amendments to the provincial laws affecting municipalities; the Municipal Superannuation act, which was designed to restore the municipal superannuation fund to a solvent basis; the Public Utilities act, which empowered a public utilities commission of three members—subject to the lieutenant governor in council to fix rates, approve the issue of securities, and supervise utility operations.

In the third session of the 19th parliament (Oct. 31, 1939–Nov. 30, 1939) legislation was enacted to exempt members of the Allied forces from certain provisions of the provincial mining laws; the Provincial Elections act thoroughly revised the election procedure; the Public Utilities commission was authorized to grant licences to motor carriers and to prescribe their rates; the Preemptors Free Grants act provided for the issuance of a free grant of land held under pre-emption by persons who subsequently became members of the armed services; and industrial undertakings were required to provide for the semimonthly payment of wages.

A special session of the legislative assembly met May 8-10, 1940; to consider legislation arising from a controversy

between the government and the petroleum industry. The Coal and Petroleum Control board, under the chairmanship of Dr. W. A. Carrothers, issued an order fixing the prices for gasoline effective Oct. 26, 1938; on Oct. 24 certain oil companies commenced an action in the supreme court of British Columbia claiming that the Coal and Petroleum Control Board act was ultra vires. After the court of appeal for province declared the act intra vires; the board, by Regulation No. 10, again fixed prices effective Aug. 7, 1939. On Aug. 5, 1939, the chief justice of British Columbia restrained the board from fixing prices until an appeal could be decided by the supreme court of Canada. On April 23, 1940, the Canadian supreme court declared the statute intra vires, and Regulation No. 10 became effective. On April 26, all oil companies in the province suspended the delivery of gasoline to dealers; after a week of this gasoline strike a compromise settlement was effected establishing the wholesale price of gasoline one cent above the price set in the disputed regulation. Subsequently, in the fourth and special session, the legislative assembly passed the Petroleum Sales act which empowered the government to engage in the petroleum industry or to incorporate companies for that purpose if it should be deemed in the public interest.

Among the enactments of the 19th parliament in its fifth session (Oct. 29, 1940–Dec. 6, 1940) were the following: the Special Assistance in the Cost of Education act provided \$250,000 for distribution in 1941–42 and \$450,000 thereafter, to relieve pressure of the property tax on land for educational purposes; the department of agriculture was empowered to inspect and grade hog carcasses, poultry products and wool; and legislation designed to stabilize the teachers' pension fund.

During the ministry of John Hart's coalition government, the 20th legislative assembly held four sessions and the 21st assembly held its first session. Legislation enacted in the first session of the 20th parliament (Dec. 4, 1941-Feb. 12, 1942) included the Dominion-Provincial Agreement act, a wartime arrangement under which the province temporarily withdrew from the income and corporation tax fields in return for an annual payment of \$12,048,367.51 from the dominion government; the Post-War Rehabilitation act, which provided for the establishment of a council-up to 12 members-which was charged with the task of planning rehabilitation measures; the Coal and Petroleum Act Amendment act (no. 2), which empowered the minister of lands to lease oil-bearing lands to private enterprise and to determine the royalty; and legislation to increase the period from five to ten years. under which a firm might receive an offered provincial bounty on pig iron and steel shapes.

Among the statutes passed by the second session of the 20th parliament (Feb. 2, 1943-March 18, 1943) were the following: the Fraser Valley Fibre Flax Loan act provided an interest-free government loan of \$85,000 to assist farmers to erect a scutching mill-the loan to be repaid in ten years; the Purchasing Commission act established a purchasing commission responsible solely to the legislative assembly in place of the former purchasing agent who had been responsible to the minister of finance; the Workmen's Compensation Act Amendment act increased the benefits available to injured workmen and their dependents; under the Indian Reserves Mineral Resources act, the province settled a long-standing controversy with the dominion over mineral rights by agreeing to share equally the revenue collected from mineral exploitation on Indian reserves; the Free Miners' Exemption act released miners and mining companies, because of war conditions, from

performing assessment work on a limited number of their mineral claims; administration of the old age pension was transferred from the Workmen's Compensation board to a newly-created Old Age Pension board in the department of the provincial secretary.

Some of the measures passed during the third session of the 20th parliament (Feb. 1, 1944-March 15, 1944) were the Liquor Revenue Agreement act, which empowered the government to enter into an agreement with the dominion under which the province was guaranteed a revenue of \$6,368,236.86—equal to the revenue from liquor sales in the year ended June 30, 1942; the Wartime Labour Relations Regulations act, which brought all industrial disputes in the province under the federal wartime conciliation regulations and suspended, in effect, the provincial conciliation measures; the Petroleum and Natural Gas act, which defined the terms under which geological and geophysical surveys could be conducted, drilling performed, and a lease secured upon the discovery of petroleum or gas; legislation authorizing the government to enter into agreements with the dominion for the purpose (1) of carrying out a program of national physical fitness, and (2) of carrying out vocational training; legislation exempting from succession duty the portion going to close kinsfolk of the estate of a deceased serviceman; the Veterans' Land Settlement act, which authorized the reservation of 1,000,000 acres for settlement by veterans under the Dominion Veterans' Land act, 1942; legislation ratifying an agreement with the dominion under which the province undertook to bear 25% of a \$5 increase in the monthly old age pension.

Legislation enacted in the fourth and last session of the 20th parliament (Feb. 6, 1945-March 28, 1945) included the following measures: The Electric Power act, which provided for the establishment of the British Columbia Power commission and authorized the commission to engage in the generation and distribution of electricity throughout the province within the limits of an initial \$10,000,000 expenditure; the Social Assistance act, which defined the responsibility, authority, and the methods for dispensing general assistance or relief through provincial or provincial-municipal channels; the Civil Service act, 1945, which provided for the competitive appointment, classification and promotion by merit, of civil servants; legislation permitting the government to spend not more than \$500,000 for the purpose of acquiring land-clearing machinery for rental to farmers; provision for a \$5,000,000 building program at the University of British Columbia, Vancouver; legislation establishing the forestry branch of the lands department as a separate department.

Among the measures enacted in the first session of the 21st parliament (Feb. 21, 1946-April 11, 1946) were the Public Utilities Act Amendment act, which created a milk board, consisting of one member, with jurisdiction over the marketing of milk; the Consumer Credit act, which authorized the government to introduce regulations covering consumer credit and instalment buying if and when federal wartime regulations were withdrawn; the Public Schools Act Amendment act, which, following the recommendations of the Maxwell Cameron report, provided for the consolidation of school districts into 74 large administrative areas, the levy of a uniform tax of five mills on real estate, and provincial grants-in-aid; legislation permitting the government to increase its advance to the British Columbia power commission from \$10,000,000 to \$20,000,000; the Slum Clearance act, which authorized the government to borrow \$500,000 for the purpose of making grants to those municipalities which, under the

National Housing act, arranged to acquire lands suitable for low-cost rental housing projects; the Coloured Gasoline Tax act, which authorized the use of purple gasoline in certain industrial, farm and fishing equipment; the Gasoline Tax Act Amendment act, which empowered the government to replace the seven cent tax on gasoline used by private vehicles with a ten cent tax-this statute anticipated a three cent reduction in the federal wartime gasoline tax; the Hours of Work Act Amendment act, which established the maximum number of working hours a week at 44 in place of the former 48-hour maximum; the Annual Holidays act, which required every employer—with some exceptions—to provide each employee with at least one week's holiday with pay per year (280 working days); other legislation created a new department of the health and the welfare branches of the department of the provincial secretary. The Constitution Act Amendment act increased the sessional allowance payable to each member of the legislative assembly from \$2,000 to \$3,000.

Dominion-Provincial-Municipal Relations.—These relationships were the subject of frequent intergovernmental discussions during the decade. Conflicting opinions were expressed before the Royal Commission on Dominion-Provincial Relations (the Rowell-Sirois commission), which held hearings in Victoria early in 1938. A brief submitted by associated boards of trade recommended the abolition of provincial governments and legislatures. Tracing the fiscal difficulties of the province partly to the unwelcome necessity of sharing the income tax field with the dominion, Premier Pattullo contended in part that provincial governments should have legal access to indirect taxation and an appropriate share of direct taxation; that some functions such as old age pensions, unemployment relief, and mothers' allowances should be transferred wholly to the dominion; and that the provincial debts should be re-

In Jan. 1941, delegates of the provincial government attended a Dominion-Provincial conference in Ottawa, called to consider the adoption of "plan one," as submitted by the Rowell-Sirois commission. At the conference, Premier Pattullo declined to accept the Sirois plan as the sole basis for discussion on the ground that the plan would, if implemented, place the province permanently in an adverse financial position. The premier, who had been consistently opposed to the suggestion that the provinces should withdraw from the income and inheritance taxation fields in favour of the dominion, also contended that centralization of economic control in the dominion government would be unduly increased under the Sirois plan. Returning to Victoria after Prime Minister King had closed the two-day conference in the face of active opposition from three provincial governments, Premier Pattullo and his Liberal government encountered severe press criticism.

In June 1941, J. L. Ilsley, dominion minister of finance, submitted a compromise wartime plan to all provincial governments. Offering compensation, Ilsley asked the provinces to withdraw from the income, corporation and inheritance (later deleted) tax fields. Subsequently the coalition government of Premier Hart signed a wartime tax agreement in Feb. 1942, under which the province, in return for an annual dominion payment of \$12,048,367.51, temporarily withdrew from the income and corporation tax fields; this agreement was to expire on March 31, 1947.

At the Dominion-Provincial Conference on Reconstruction in Ottawa, Aug. 1945, the dominion government pro-

posed that, at the termination of the wartime tax arrangement, the provinces should remain out of the income and corporation tax fields and vacate the inheritance tax field also for a further period of three years. As compensation to the provinces, the dominion offered to pay a per capita subsidy of not less than \$12 per capita—varying with population and gross national production per capita; to assume the full cost of the existing old age pensions and offer to assist through conditional grants-in-aid a wide social security program; and to co-ordinate dominion, provincial and municipal public investments through a system of planning and timing grants-in-aid. At the Nov. 1945 meeting of the Co-ordinating committee, comprised of federal ministers and provincial premiers, Premier Hart indicated that the provincial government endorsed the full employment and social security objectives advanced by the dominion at the Dominion-Provincial conference in August; that the province would consent to dominion administration of the income and inheritance tax fields if satisfactory financial arrangements could be devised; but that the dominion's financial proposals, as presented in August, were not adequate. As a criterion of adequacy, Premier Hart indicated that the annual compensation should equal the revenue that the province would otherwise collect, at prewar rates, from the relinquished tax fields.

Early in 1946, the dominion government revised the financial proposals originally submitted to the provinces in Aug. 1945. Most interesting to the British Columbia government was the new alternative plan under which the dominion offered to pay, as a minimum, either (1) a variable subsidy of not less that \$15 per capita, or (2) a total sum not less than 150% of the wartime tax payment; the second alternative meant an annual minimum subsidy of \$18,000,000 to British Columbia, as compared with \$9,000,000 originally offered by the dominion in Aug. 1945. At the Dominion-Provincial conference in May, 1946, the position of Hart's government was not announced before the intergovernmental discussions collapsed. Subsequently, in his budget speech of June 27, 1946, J. L. Ilsley indicated that the dominion government was ready to sign individual financial agreements with any or all provinces ready to accept the annual subsidy in one of its alternate forms (minimum \$15 per capita, or 150% of wartime tax payment).

The uncertain outcome of the dominion-provincial financial negotiations had an unsettling effect on provincial-municipal relations during the decade 1937-46. During the depression of the early '30s, the province had reduced grants-in-aid to municipalities and increased their portion of social welfare costs; in addition, the municipalities had been required to pay part of the cost of unemployment relief. Frequent representations were made by the municipalities to the province during the decade for a financial readjustment, and it was contended before the Royal Commission on Dominion-Provincial relations in 1938 that the cost of municipal functions was increasing faster than the revenue from the tax on real property, and that the real property tax represented the only important sources of municipal income and the levies were already excessive. Finance Minister John Hart, in his budget speech of Nov. 10, 1939, stated that the provincial government had restored significantly the grants-in-aid to municipalities; and by assuming the full cost or major portion of certain social services, by granting larger sums for the support of education, he contended that important financial readjustments had been made and further adjustments would be conditioned by the settlement of dominion-provincial financial arrangements. Additional provincial grants-in-aid for education were made in 1941–45.

On Nov. 27, 1944, Dr. Maxwell A. Cameron, professor of education at the University of British Columbia, was appointed sole member of a royal commission to enquire into the incidence of the cost of education. In his report, Dr. Cameron recommended that the system of local school boards be retained and the existing school districts be reformed into larger administrative areas. He also advocated equalized assessments with a basic provincial program, to be financed in part by increased provincial grantsin-aid and a uniform tax of five mills upon real property. A substantial part of the Cameron report was implemented by the Government in the Public Schools Act Amendment act, 1946. Provincial-municipal relations again became the subject of enquiry when on Feb. 16, 1946, H. Carl Goldenberg was appointed sole commissioner to investigate the performance of municipal functions within the province and the fiscal relations between municipalities and the

Commissions of Enquiry.-In addition to the Cameron and Goldenberg commissions previously mentioned, other royal commissions conducted investigations during the decade. Marketing methods of certain fruit agencies, charged with malpractices by Okanagan fruit growers, were investigated by the dominion combines commissioner, F. A. McGregor, during the summer of 1939. In July 1941, G. McG. Sloan, later justice of the court of appeal, was appointed commissioner to enquire into the administrative policy of the Workmen's Compensation board; in his report of Sept. 1942, Justice Sloan reported that the Workmen's Compensation act had been efficiently administered and suggested a moderate expansion of its coverage as well as upward adjustments in the scale of compensation. On Sept. 30, 1941, Judge A. M. Harper was appointed sole member of a royal commission to enquire into the administration of the marketing boards constituted under the National Products Marketing (British Columbia) act. On Dec. 31, 1943, Justice Sloan was again appointed a commissioner to investigate the utilization and conservation of the forest resources; the major change to established policy contained in his report—released in Feb. 1946—was a recommendation that the forest service should be transferred from the department of lands to the jurisdiction of an independent forest commission, which would be responsible for forest planning and administration, and would disburse forest revenues without direct reference to the government or the legislative assembly. In Nov. 1944, in addition to the Cameron commission, two other enquiries were authorized; J. A. Grimmett was appointed a commissioner to investigate the operation of societies offering accident or sickness benefits; A. J. Cowan was empowered to investigate the operation of life insurance clubs. On May 11, 1946, E. T. Kenney, minister of lands and forests, announced that Dean Frederick M. Clement, head of the department of agriculture, University of British Columbia, had been appointed a commissioner to enquire into the ability of the irrigation, drainage and dyking districts of the province to repay their indebtedness to the provincial government.

Other Events.—The depression had not lifted completely at the beginning of the decade, and gave place to a war-induced prosperity at the close. There were some weeks of disturbances in June and July 1938, when a body of unemployed occupied buildings in Vancouver and Victoria. Campbell river, on Vancouver island, was the scene

of a disastrous 75,000-acre forest fire in July 1938. The spring of 1939 saw the opening of a provincial exhibit at the Golden Gate International exposition in San Francisco, Calif., and the appointment of two provincial representatives on the Canadian section of the International commission studying the proposed British Columbia-Alaska highway; in May, the new Vancouver hotel in Vancouver opened under the joint management of the Canadian National and Canadian Pacific railways. The most colourful event of 1939 came in June, when King George VI and Queen Elizabeth visited the province in the course of a nation-wide tour. Favourable geological reports from the Peace river area prompted the provincial government-after the outbreak of World War II in Sept. 1939—to embark on unsuccessful oil drilling operations, which were carried out during 1940-42. Also in 1941 the Duke of Kent visited the province,

and the coastal cities experienced their first "blackout" (Dec. 8). Early in 1942, the dominion government expelled all Japanese fishermen from that industry and gradually removed members of this racial group from strategic coastal areas. On Oct. 21, 1942, the new Royal Canadian Naval college at Royal Roads, Esquimaltnear Victoria-was commissioned. Completion of the U.S.-Canada military highway through northern British Columbia to Alaska was announced in November. In 1943, the Public Utilities commission required the British Columbia Electric Railway Company, Limited, to supply free electric service for one month in Vancouver and lower mainland areas, and two months in other parts of the province served by the company; this regulatory device was repeated in 1944. The future of the provincially-owned Pacific Great Eastern railway in the development of northern areas was referred, in 1945, by Premier Hart to a joint committee comprised of dominion, British Columbia, Alberta, Canadian Pacific and Canadian National railways representatives. Also relevant to northern development was the award of contracts in July 1945, calling for the completion of a 251-mi. road between Dawson creek on the Alaska highway and Prince George: construction pro-

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ceeded during 1946.

		1938		1941	1	944
ltem .	Value (000's omitted	Amount or Number	Value (000's omittee	Amount or Number	Value (000's omittee	Amount or Number
Exchange rate	(000 3 0,,,,,,,,,	, 110111561	(000 3 01111100	1/ 140111561	(000 3 Ommec	i) Homber
Great Britain		\$4.867 Canad	ian	\$4.45 Canadian	ı	\$4.45 Canadian
United States		=£1 \$1 Canadian =99.4 cent	5	=£1 \$1 Canadian =87.3 cents		=£1 \$1 Canadian =89.8 cents
Finance						
Provincial revenues	£6,993 (\$34,189)		£9,340 (\$37,657)		£8,862* (\$35,760)	
Provincial expenditures	£6,329 (\$30,944)		£8,216 (\$33,128)		£7,513* (\$30,326)	
Transportation						
Railroads		3,891 mi. 20,414 mi.		3,883 mi.		3,856 mi.
Communications		20,414 mi.		21,436 mi.		21,946 "
Telephones		135,827		157,460		173,011
Telegraph lines		100,251		125,714		7,039 mi. †
Minerals		100,231		123,714		162,655 †
Gold		605,617 oz.		617,011 oz.		196,857 oz.
Lead		201,853 tons 149,682 ,,	•	‡8 ‡8 ‡8		146,461 tons 139,032 ,,
Copper		32,880 "				18,151 ,,
Coal		1,440,287 "		1,867,846 tons		2,134,231 "
Crops Hay and clover		271,000 ton	5	325,000 tons		490,000 tons †
Alfalfa		152,000 ,,		156,000 ,,		203,000 ,, †
Potatoes		101,000 ,,		105,000 ,, 88,000 ,,		92,000 ,, † 57,000 ,, †
Wheat		43,000 "		51,000 ,,		76,000 ", †
Livestock Cattle		324,000		325,000		417000 ÷
Sheep		180,000		126,000		417,000 † 139,000 †
Horses		67,000 48,000		63,000 78,000		60,000 † 69,000 †
Manufactures		40,000		78,000		89,000
Total	£50,956 (\$251,924)		£53,682¶ (\$238,081)	•••	£146,8929 (\$592,710)	•••
Sawmills	£10,851 (\$53,648)		£11,817¶	•••	£19,1650	•••
Fish-curing and packing	£3,117 (\$15,409)		(\$52,410) £3,734¶ (\$16,759)	•••	(\$79,147) £4,7829 (\$19,295)	•••
Pulp and paper	£3,649		£3,474¶		£6,5079	•••
Petroleum products	(\$18,039) £2,124∥		(\$1 <i>5,427</i>) £2,575¶	•••	(\$26,254) £3,336♀	
•	(\$10,49 9)		(\$11,428)	•••	(\$13,460)	•••
Shipbuilding and repairs	£444 (\$2,194)		£633¶ (\$2,809)	•••	£35,03998 (\$141,382)	• • •
Education Enrolment						
Provincial schools		1 <i>54,520</i> 6,749		150,176		143,069
Dominion Indian schools		4,072		7,013 3,714		9,172 3,589
Universities and colleges		4,561		4,577		3,265
*Provisional figures.			1937. 1939.			
†1945. ±1940.			¶1939. 91943.			
§Wartime restrictions prevent publicat	tion of detaile	a data.		n value in 1937.		

Howay, W. N. Sage and H. F. Angus, British Columbia and the United States (1942); B. H. Kizer, The U.S. Canadian Northwest (1943); F. D. Mulholland, The Forest Resources of British Columbia (1937); C. H. Young, H. R. Y. Reid and W. A. Carrothers, The Japanese Canadians (1938). (G. N. P.)

British East Africa

Under this heading are grouped British possessions on the east coast of Africa, namely: one colony (Kenya), one mandated territory (Tanganyika), and four protectorates (Uganda, Nyasaland, Zanzibar and British Somaliland). For reasons of geographical logic the island colonies of Mauritius and Seychelles are also described here.

Kenya.—Area 224,960 sq.mi.; pop. (est. 1944) 3,940,000 of whom 32,000 were Europeans, 61,000 Asiatics and 19,000 Arabs (1940 census, 3,534,862). Chief towns: Nairobi (cap.; pop. est. 1939, 65,000), Mombasa (57,300). Languages: English, Swahili, Bantu and Nilotic dialects.

Governors: Air Chief Marshal Sir Robert M. Brooke-Popham (Nov. 1936–Oct. 1939); Sir Henry Monck-Mason Moore (Oct. 26, 1939–Sept. 1944); Major-General Sir Philip Mitchell (after Sept. 19, 1944).

Tanganyika.—Area (not including water area) c. 342,700 sq.mi.; pop. (est. 1944) 5,498,600 of whom 16,100 were Europeans and 46,500 Asiatics. Chief towns: Dar es Salaam (cap., pop. 33,500), Tabora (25,000). Languages: English, Swahili, Bantu and Bushman dialects. Religions: Christian, pagan.

Governors: Sir Harold MacMichael (Jan. 25, 1934-37); Sir Mark A. Young (March 4, 1937-41); Sir Wilfrid E. F. Jackson (June 19, 1941-45); Sir William D. Battershill (after April 28, 1945).

Uganda.—Area (including the kingdom of Buganda but excluding the water area) c. 80,300 sq.mi.; pop. (est. 1944) 3.956,654 of whom 2,553 were Europeans and 27,573 Asiatics; among the Africans c. 910,000 were Boganda. Chief town: Entebbe (cap., pop. c. 7,300). Languages: English, Swahili, and mainly Bantu dialects. Religions: Christian and pagan.

Governors: Sir Philip E. Mitchell (Oct. 1935–40); Sir Charles Dundas (July 8, 1940–44); Sir John Hathorn Hall (after Sept. 19, 1944).

Nyasaland.—Area (land only) 36,829 sq.mi.; pop. (est. 1944) 2,188,000 of whom 1,812 were Europeans and 2,200 Asiatics (1940 census, 1,686,045). Chief towns: Zomba (cap., 3,000), Blantyre (6,000). Languages: Chinyanja, English and native dialects. Religions: Christian and pagan.

Governors: Sir H. B. Kittermaster (1934-39); Sir Henry C. D. C. Mackenzie-Kennedy (Feb. 24, 1939-42); Sir Edmund Richards (after June 5, 1942).

Zanzibar.—Area: Zanzibar island 640 sq.mi., Pemba island 380 sq.mi.; pop. (est. 1944) 250,000 (1941 census, 243,-296). Chief town: Zanzibar (cap., 50,000). Languages: Arabic, Swahili and English. Religions: Mohammedan and Christian.

Residents: Sir R. S. D. Rankine (Dec. 1929–37); Sir John Hathorn Hall (Sept. 1937–40); Sir Henry Guy Pilling (Dec. 23, 1940–45); Sir Vincent G. Glenday (after March 3, 1945).

British Somaliland.—Area: 67,936 sq.mi.; pop. (est. 1944) 700,000. Chief towns: Hargeisa (cap., 20,000), Berbera (20,000). Languages: Somali and Arabic. Religion: Mohammedan.

Governors: Sir Arthur Lawrence (June 18, 1932–39); Sir Vincent G. Glenday (March 2, 1939–41); (military administration) Brigadier A. R. Chater (March 1941–43); Brigadier G. T. Fisher (after Feb. 1943).

Mauritius.—Area: 720 sq.mi.; pop. (census 1944) 419,185 in Mauritius proper and 13,463 in the dependencies. Chief towns: Port Louis (cap., 66,469). Languages: French and English. Religions: Roman Catholic 141,941; Protestant 4,165; the rest Hindu or pagan.

Governors: Sir Wilfrid E. F. Jackson (March 7, 1930-37); Sir Bede E. H. Clifford (May 21, 1937-42); Sir Henry C. D. C. Mackenzie-Kennedy (after July 5, 1942).

Seychelles.—Area: 156 sq.mi.; pop. (est. 1943) 33,600. Chief town: Victoria (cap., 5,500). Languages: French and English. Religion: Christian.

Governors: Sir Arthur F. Grimble (1936–42); Sir William M. Logan (after Jan. 5, 1942).

* * *

By 1937, Italy had occupied Ethiopia. One-third of the European population of Tanganyika was German, and there was a body of opinion in Britain which favoured the return of Tanganyika to Germany. East Africa therefore was war-conscious. At the outbreak of World War II, all German nationals were interned, rather surprisingly without incident. The East Africa force was formed in Nairobi under the command of Major-General D. P. Dickinson, whose foresight was responsible for the creation of a highly mobile force admirably suited for the campaign against the Italians which was successfully carried out in 1941 by General Sir Alan Cunningham. The prewar strength of the East African military forces was under 1,500, with a spe-

cial reserve and a reserve of officers. In Kenya, there had been conscription for Europeans for some years; there were also volunteer units of the army and navy as well as a volunteer women's auxiliary unit. Out of Kenya's prewar European population of under 20,000, more than 3,500 men served with the forces, and 57% of the women were engaged in full-time employment.

Voluntary recruiting of Africans met with immediate and wholehearted response in all the territories. In the war years, Kenya supplied 100,000 men; Tanganyika 90,000; Uganda 70,000; and Nyasaland 30,000. They were rapidly trained for all branches of the land forces, and the training of African artisans at one time reached an output of 1,000 a month. Two divisions were in the field by the end of 1940. East African troops under British officers served with distinction in the campaigns in Ethiopia, the middle east, Madagascar, and Burma, where 50,000 took part in operations against the Japanese. Mauritius and Seychelles also contributed engineers and artisans to the British forces. Casualties in the East African forces in killed and died of wounds were: African 1,516, Europeans 81.

From Dec. 1942 to Oct. 1943, the eastern fleet had its base in Mombasa. East African command, formed in 1941, at one time covered 2,000,000 sq.mi. and maintained 22,000 mi. of communications. Subsequent general officers commanding in chief, East Africa, were: General Sir William Platt, 1941–44; Lieut.-General Sir Kenneth A. N. Anderson, 1945; and Major-General William A. Dimoline, 1946.

Meanwhile, in the years 1939–44, there had been a drive to increase production of all commodities needed for war, in which both European and African farmers played their part. Despite the absence of men in service, the acreage of flax was increased fivefold; of wheat threefold; of barley twofold. Production of timber was raised to four times its normal output; bacon was trebled; and butter doubled. Pyrethrum, an insecticide, became Kenya's most valuable export, while in Tanganyika nearly 5,000 ac. were planted during the war. Increases in sisal and many other commodities were also recorded. In the Kikuyu native reserve in Kenya, two dehydration factories had a capacity of 80 tons of fresh vegetables per day.

An enormous strain was placed upon the railways in Kenya and Tanganyika, coupled with great difficulties in maintenance. During World War II traffic increased in some cases to 350% of normal, while the port at Mombasa was called upon to deal with 40% above the prewar tonnage. Two new deep-water berths which took two years to build were completed in 1944. The railway and harbour workshops took on the manufacture of armoured cars, land mines and trench mortars.

An East African industrial council with a research committee was formed to foster the manufacture of articles and materials which could not be imported, such as pottery, building materials, fuel oil from cotton seed, soap and edible oil. Though they served a most useful purpose in wartime, it was doubtful if they would prove economic on a large scale in normal times.

The civil governments took over responsibility for all demobilized men, and schemes for rehabilitation, resettlement and training were prepared. Agricultural and technical training was provided for Africans on a large scale. Settlement committees for both Europeans and Indians were formed. An agricultural school for Europeans existed before World War II at Njoro in Kenya, and one for Asiatics was being built in Tanganyika. To finance 500 new settlers in Kenya, a sum of £1,600,000 was made available.

As a result of World War II the outlook of the African



British East African pioneers practising grenade throwing as part of their training. Pioneers contributed valuable services during the North African campaigns of World War II

soldier changed considerably. He saw other lands and was trained to do highly-skilled work. An education corps was very active in all units; Africans attended lectures, listened to vernacular broadcasts, and saw propaganda and entertainment films. Free postage for all in the service encouraged literacy. Army rates of pay were from three to ten times as high as those paid for casual labour in peacetime, apart from all the extras in food, clothes and other facilities. It was natural, therefore, that the African soldier should not want to return to peasant farming. The greatest number wished to become traders; others wanted to be artisans or clerks. In all these occupations Africans found themselves at a disadvantage in competition with the established Indians. It had been realized for several years that increased Indian immigration obstructed the progress of the Africans, but until all immigration was controlled during the war no restrictions had been imposed. In 1946, a measure was proposed by the British government by which capital requirements of non-native intending immigrants was fixed at £800 for farmers, £1,000 for miners, £2,500 for traders, and up to $f_{10,000}$ for industrialists.

With the increase in education, the African developed a political consciousness. An African study union was formed where debates on matters of topical interest were held. African newspapers also increased. In Kenya there were eight in 1946 where there was only one in 1939, and the combined circulations amounted to 85,000.

The first African to sit in an East African legislature was appointed in Kenya in 1944. Up to 1946, two had been nominated in Tanganyika and three in Uganda.

Education of African children was provided by government schools and schools of Christian missions, in many cases aided by the government. In spite of the difficulties of wartime, the scope of these institutions increased. Postwar schemes in all the territories included generous provisions for improvement of educational services. The college for higher education of Africans at Makerere in Uganda, which accepted students from all territories, was raised to the status of a university college as a result of the visit of a commission on higher education which visited Uganda in 1937. Arrangements were being made for its expansion

to full university status. In 1946 it accommodated 161 students, of whom 73 were from Uganda, 37 from Kenya, 34 from Tanganyika, 13 from Zanzibar and 3 from Nyasaland.

Large schemes for development and reconstruction were under consideration in all the East African territories, and ten-year plans were formulated. The Colonial Development and Welfare act of 1945 made large sums of money available for these purposes from the British government, which were augmented by the financial resources of the territories. The government grants, apart from research, were: Tanganyika £5,250,000; Kenya £3,500,000; Uganda £2,500,000; Nyasaland £2,000,000; British Somaliland £750,000; Zanzibar £750,000; and Seychelles £250,000. The money was to be spent on such services as education, medical services, agricultural and fishery development, water supplies, African housing and communications.

Conscription of African labour, introduced as a war measure, was permitted only for essential services and essential war production. In Tanganyika, 80,000 men were so conscribed and in Kenya 60,000. The period of service ranged from two months to one year. In Sept. 1946, conscription ceased.

The catastrophic loss of soil fertility in almost all native areas, resulting from wrong methods of cultivation and overstocking, was a matter of grave concern during the years 1939–46. A campaign started in 1931 received insufficient financial support from governments and little cooperation from the natives. The situation became rapidly worse, and large areas of land were thought to be beyond reclamation. Millions of pounds would need to be spent on soil conservation after 1946.

The spread of tsetse fly, particularly in Tanganyika and Uganda, also caused alarm. In the former territory two-thirds of the country was affected, and though in the years 1937–46 some 1,150 sq.mi. were cleared other areas became infested. New methods of dealing with the problem were being tested.

In all territories expenditure and revenue increased. These figures and those of exports and imports are shown in the accompanying table:

	Year	Revenue £	Expenditure £	Imports £	Exports £
Kenya	1937	3,668,000	3,566,000	5,181,000	3,954,000
	1944	7,734,000	7,629,000	8,610,000	5,793,000
Tanganyika	193 7	2,345,000	2,174,000	3,783,000	5,311,000
- ,	1944	4,207,000	4,193,000	5.829.000	7,430,000
Uganda	1937	1,960,000	1,754,000	3,556,000	5,703,000
	1944	2,658,000	2,598,000	2,813,000	7,531,000
	1945	· <u></u>	_	3,281,000	9,939,000
Nyasaland	1937	545.000	692,000	863,000	887,000
.,	1944	1,029,000	1,038,000	1,713,800	1,502,000
	1945		-	1,580,000	1,876,000
Zanzibar	1937	495,000	486,500	1.229.000	663,300
	1944	639,000	565,000	1,249,000	1,174,000
British Somaliland	1937	258,000	213,000	288.000	276,000
	1942	216.000	189,000		
Mauritius	1937	1.194.000	1,162,850	2,567,025	2,706,075
	1944	2.603.475	2,386,800	4,927,950	3,471,975
Seychelles	1937	94.725	112,725	94,725	112,650
,	1945	94,800	86,700		

The war department spent vast sums in the territories during 1939–45, £120,000,000 in Kenya alone. Over £10,500,000 was subscribed to East African war bonds up to the end of 1945. The formation of East African airways to operate trunk and local services in association with British Overseas Airways Corporation was agreed upon in 1945. This necessitated a new airport in Nairobi at a cost of £1,000,000. Another airport was to be built in Livingstone, Nyasaland, at a cost of £250,000.

The need for co-ordination in the territories was more apparent during the war than before. The weaknesses of the conference of East African governors, the existing co-ordinating body, led the British government to issue a

White Paper in 1945, outlining a proposal which was issued for discussion, by which a high commission, a central legislature, and an executive organization supported by advisory boards would administer the services common to Kenya, Tanganyika and Uganda. Much controversy was caused by the proposal of racial equality as between Africans, Europeans and Indians in territorial representation.

The undersecretary of state for the colonies, A. Creech Jones, visited the East African territories in July 1945.

Kenya.-In 1937, income tax was introduced into Kenya and in the first year produced £100,000 in revenue against an estimate of £43,000. In the following year the Native Lands Trust bill was passed. This defined native areas in accordance with the recommendations of the Carter commission. Progress in African education continued in spite of the war. Between 1937 and 1945, the number of African children attending school rose from 100,872 to 124,185. Local native councils assumed responsibility for day schools in the reserves in 1943. To restrict speculation in land, the land control board was appointed in 1944. It had substantial nonofficial representation and wide powers. Changes were made in the administration by regrouping departments and by the appointment of a deputy chief secretary, in order that the chief secretary might devote himself to reconstruction. The close association of nonofficials with government on the numerous boards and committees that were formed in connection with the organization of supplies, price control, food rationing, etc., resulted in the appointment of a nonofficial to the post of secretary for agriculture, animal husbandry and natural resources.

Kenya's reconstruction program of 1946 included the following expenditure: agricultural development £1,500,000; reconditioning African lands £3,000,000; European settlement £1,600,000; education £2,344,000; roads £1,250,000 and buildings £1,500,000.

Tanganyika.—In 1939, income tax for non-natives was introduced as a wartime measure, but later was adopted as a permanency. An economic control board was set up in 1942 to co-ordinate production and supplies. After the fall of Singapore, experts in rubber production were sent to bring the old rubber plantations, planted by the Germans, into production and to explore the possibilities of wild rubber vines. A research laboratory was set up in Amani. In 1946, Tanganyika came under United Nations trusteeship, and some disappointment was expressed locally that it had not been made a colony. It was also decided that former axis properties should be taken over against reparations and allocated for native and non-native settlement. A commission visited the territory in the same year to make proposals for a scheme for the production of groundnuts on a large scale, involving 700,000 ac.

The Aga Khan was weighed in diamonds in Dar es Salaam to celebrate his diamond jubilee in Aug. 1946.

Uganda.—In 1939, the kabaka (king) of Buganda died and was succeeded by a lad, Mutesa II. During his minority a regency of three prominent Baganda was set up. In 1942, the queen mother married a commoner, causing much controversy as a result of which a minister, Nsibirwa by name, was forced to resign. There were serious disturbances in the protectorate, chiefly in Kampala, early in 1945, with some loss of life and damage to property. They took the form of a strike, but subsequent inquiry by the chief justice attributed them to political intrigue, suspected of being from the same source as that which caused the resignation of Nsibirwa. The rioting took the government entirely by surprise, and most of the senior officers were away at



Royal African troops on the border of Kenya and Italian Somaliland in 1941. They are shown moving back part of the stone boundary erected by the Italians to mark their briefly held colonial frontiers in East Africa

the time. A detachment of the king's African rifles restored order. As a result of the affair, another minister who had previously been a regent resigned, and Nsibirwa was recalled to the post of prime minister. Later in the year he was assassinated by an African. In 1946, the young kabaka was a student at Magdalene college, Cambridge, England. Uganda's main product, cotton, accounted for 71% of total exports in 1945. Production declined during the years of World War II. Arrangements were made for the establishment of a central cotton research station by the Empire Cotton Growing corporation with a financial contribution from the colonial office. The protectorate in 1946 had 2,500,000 head of cattle and 3,250,000 sheep and goats.

Nyasaland.—In 1937, a commission of inquiry into the possibilities of closer association between Nyasaland and the Rhodesias visited the protectorate. Afterwards proposals for the amalgamation of the territories were made, but up to the closing months of 1946 had not been accepted. A very large number of natives were leaving their country for work in the mines in Rhodesia and South Africa. Anxiety was felt that too few able-bodied men were left in their villages for the healthy development of the country.

Recruiting for the mines in South Africa was restricted during the war.

Representatives of Nyasaland took part in the Central African council, an advisory body set up in 1944. African provincial councils were formed in 1944 with such success that an African protectorate council was established. The first woman member of the legislative council was appointed in 1946.

Development schemes for the years 1946-56 included allocations as follows: education £1,869,376; health £1,814,304; agriculture £1,254,192; roads £1,075,000; air transport £309,790; and posts and telegraphs £220,968. The building of a technical school was also proposed at a cost of £250,000.

Zanzibar.—In 1938, the government decided to spend £200,000 to relieve debt in the colony. At the outbreak of war, the sultan placed his resources at the disposal of the British, and broadcast in support of the Allied cause. Extensive planting of food crops was carried out to meet war needs, but in spite of this the crop of cloves, Zanzibar's chief export, was a record. Students in social welfare were sent to the London school of economics for training in 1943.

The bi-centenary of the Al Busaid dynasty was celebrated in 1944.

British Somaliland.—In 1939, a severe drought necessitated the issue of famine relief. At the outbreak of World War II, the Somaliland camel corps was not under command of East Africa force, but under the French general in Jibuti. After the fall of France, the protectorate was reinforced by two battalions of East African troops, one British regiment and some Indian troops. Against vastly superior Italian forces they held out for six days until orders to evacuate were received. This was accomplished without interference. The protectorate was reoccupied in March 1941, and Berbera became the main supply port for the attack on Addis Ababa and the occupation of southern Ethiopia.

Much progress was made in education and medical services, including clinics, by the military government which was administrating the country after the reoccupation. An experiment in date planting was made.

Mauritius.—In 1938, a dockers' strike caused some disturbance as a result of which the ringleaders were deported to Roderigues island. In the following year the local Labour party was suppressed. The colony experienced a severe drought in 1939 which caused losses of £750,000. A department of education was created in 1941, and students in social welfare were sent to the London school of economics for training two years later. A good yeast factory was established in the colony in 1944.

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British Empire

The governments of the British Empire and the governors and premiers were as follows on Dec. 31, 1946:

British Empire						
Country	Area sq.mi. (approx.)	Population (000's omitted) Capital	Status	Rulers, Governors and Premiers	
Europe Great Britain and Northern Ireland.	93,991	47,157 ^	London	Kingdom	George VI, King-Emperor. Prime Minister of Great Britain: C. R. Attlee. Governor of Northern Ireland: Vice-Adm. Lord Granville. Prime Minister of Northern Ireland: Capt.	
Channel Islands	75	<i>7</i> 9 ⁴	St. Helier	Part of kingdom of Great Britain	Sir Basil Brooke. Jersey: Lt. Gen. Sir A. E. Grassett.	
Eire	26,601	2,950♀	St. Peter Port Dublin	and N. Ireland Republic associated with the British Commonwealth of Nations	Guernsey: Lt. Gen. Philip Neame. President: S. T. O'Kelly. Prime Minister: Eamon de Valera.	
`ibraltar	2 221	20† 51†	Gibraltar Douglas	Colony Part of kingdom of Great Britain and N. Ireland	Lt. Gen. Sir Ralph Eastwood. Air Vice-Marshal Sir G. Bromet.	
Malta	122	285+	Valletta	Colony	F. C. R. Douglas.	
Aden and Perim	80 112,000	46† 600†	Aden	Colony)	Sir Reginald S. Champion.	
Bahrein Islands	213	908	Manama	Protectorate Protectorate	Ruler: Sheikh Sir Hamad bin 'Isa al Khalifah.	
State of North Borneo	29,347 2,226	300 ⁴ 41 ⁴	Sandakan	Colony	E. F. Twining.	
Sarawak	50,000	6004	Brunei Kuching	Protectorate Colony	W. J. Peel (Brit. res.). Sir Charles Clarke.	
Burma	261,749	16.8248	Rangoon	British dependency	Maj. Gen. Sir H. Rance.	
Ceylon	25,332	6,651	Colombo	Colony	Sir H. Monck-Mason Moore,	
Cyprus	3,572	3959	Nicosia	Colony	Lord Winster.	
Hong Kong	391	1,072‡ 388,998∥	Victoria New Delhi	Colony Member of the British	Sir Mark Young.	
maran sinpire	1,561,410	300,770[]	New Delmi	Commonwealth of Nations	Emperor of India: H. I. M. George VI. Viceroy and Governor General: Field Marshal	
Malaya:					Lord Wavell. Governor General: Malcolm MacDonald.	
The Straits Settlements	1,356	1,435§	Singapore	Colony	Sir F. Gimson,	
Malayan Union	51,866	4,1248	ogapore	Protectorates	Sir E. Gent, Governor. The Rulers of Johore, Kedah, Kelantan, Negri Sembilan, Pahang,	
Palestine	10,159	1,7500	Jerusalem	Mandated territory	Perlis, Selangor and Trengganu. Lt. Gen. Sir Alan Cunningham, High Commissioner.	
Africa						
Kenya Colony and Protectorate	224,960	3,940 ₺	Nairobi	Colony and protectorate	Sir P. E. Mitchell.	
Uganda Protectorate	80,300	3,930 o	Entebbe	Protectorate	Sir John Hall.	
Mauritius (and Dependencies)	1,020 807	250 t 433 t	Zanzibar Port Louis	Colony and protectorate	Sir Vincent Glenday (Brit. res.).	
Nyasaland	37,374	2.188 č	Blantyre	Colony Protectorate	Sir Donald Mackenzie-Kennedy. Sir E. C. Richards.	
St. Helena and Ascension	81	2,1.05 5 5 †	Jamestown	Colony	Major W. B. Gray.	
Seychelles	156	34♀	Victoria	Colony	Sir W. M. Logan.	
Somalitand Protectorate	67,936	700 à	Hargeisa (admini- strative centre)	Protectorate	Brigadier G. T. Fisher, Under Military Gov- ernment.	
Basutoland Protectorate Bechuanaland Protectorate	11,716 275,000	c. 664* 275†	Maseru Mafeking, in Cape Province	Protectorate } Protectorate	Sir Evelyn Baring, High Commissioner.	
Northern Rhodesia	290,323 150,333	1,382‡ 1,576 [‡]	Lusaka Salisbury	Colony Self-governing colony	Sir E. J. Waddington. Maj. Gen. Sir John N. Kennedy.	
Swaziland Union of South Africa	6,704 472,494		Mbabane Pretoria (seat of government)	Protectorate Dominion	Premier: Sir G. M. Huggins. Sir Evelyn Baring, High Commissioner. Major G. B. van Zyl. Premier: Field Marshal J. C. Smuts.	
South-West Africa	317,725	321§	Cape Town (seat of legislature) Windhoek	Mandated territory		
Nigeria, including British	•	•	TT III III III III	Colony and protectorate	Col. P. I. Hoogenhout, Administrator.	
Cameroons	372,674 4,068		Lagos Bathurst	Brit. Cameroons: mandated territory S Colony	Sir A. F. Richards, Sir Hilary R. Blood.	
Gold Coast, including British	01.040	20/05	A	Colony and protectorate	C) 11 D	
Togoland	91,843 27,925	3,963¶ 2,000†	Accra Freetown	Brit. Togoland: mandated territory	Sir Alan Burns.	
Anglo-Egyptian Sudan	967,500		Khartoum	Colony and protectorate Condominium	Major Sir H. C. Stevenson. Maj. Gen. Sir H. J. Huddleston.	
Tanganyika Territory	342,700	5,499 b	Dar-es-Salaam	Mandated territory	Sir W. D. Battershill,	
, -				•		

Country	Area sq.mi. (approx.)	Population (000's omittee	d) Capital	Status	Rulers, Governors and Premiers
America Bahamas	4,404 166 19 80,500 8,598 3,466,556	73¶ 201¶ 32† 3649 62¶ 11,8129	Nassau Bridgetown Hamilton Georgetown Belize Ottawa	Colony Colony Colony Colony Colony Dominion	W. L. Murphy. Sır H. Grattan Bushe. Sir Ralph Leatham. Sir G. J. Lethem. Sir J. A. Hunter. Field Marshal Lord Alexander. Premier: W. L. Mackenzie King.
Falkland Islands and Dependencies Jamaica and Dependencies Leeward Islands (Antigua, St. Kitts- Nevis, Montserrat and the Virgin	7,681 4,722	3† 1,198¶	Port Stanley Kingston	Colony Colony	Sir A. W. Cardinall. Sir John Huggins.
Islands)	422 152,734 1,978	93¶ 317□ 522¶	St. John (Antigua) St. John's Port of Spain St. George's	Colony Colony, constitution suspended Colony	Sir L. B. Freeston. Sir Gordon Macdonald. Sir Bede Clifford.
inica, St. Vincent and St. Lucia) . Oceania Commonwealth of Australia	825	275¶ 7,446 ^	'(Grenada) Canberra	Colony Dominion	Sir Arthur Grimble. H. R. H. the duke of Gloucester.
Fiji	7,083 103,415	255 ^D 1,746°	Suva Wellington	Colony Dominion	Premier: J. B. Chifley. Sir A. W. Grantham. Lt. Gen. Sir B. Freyberg. Premier: Peter Fraser.
Papua	90,540 c.11,888	339‡ 165*	Port Moresby	Part of Commonwealth of Australia Colonies and protectorate	H. L. Murray, Administrator. Sir A. W. Grantham, High Commissioner.
New Hebrides	5,700 93,000 1,133 8	50† 675‡ 63¶ 3§	Vila Rabaul Apıa	Condominium Mandated territory Mandated territory Mandated territory	Sir A. W. Grantham, High Commissioner. Col. J. K. Murray, Administrator. Lt. Col. F. W. Voelcker, Administrator. Lt. Col. F. R. Chalmers, Administrator.
*Pop. est. 1938. †Pop. est. 1970. †Pop. est. 1945.	939. ‡Po ^Pop. est	pp. est. 1940. . 1946.	§Pop. est. 1941. ensus 1946.	Census 1941.	2. ♀ Pop. est. 1943. ♂ Pop. est. 1944.

British Guiana

A British crown colony in northeastern South America, British Guiana is bounded on the north by the Atlantic ocean, on the east by Dutch Guiana (Surinam), on the south by Brazil, and on the west by Brazil and Venezuela; it is located between 1° and 8° north lat. and 57° and 61° west long. Area, 89,480 sq.mi.; pop. (1931 census), 310,933. Later official estimates of population were as follows: (1938) 337,521; (1939) 341,237; (1940) 346,982; (1942) 361,754; (1943) 364,694. Racial groups in the population include 159,249 East Indians, 135,364 Negroes, 9,419 aborigines, 8,361 Portuguese and 3,557 Chinese (1943 ests.). The East Indian fraction is numerically greater than in any other American area except Trinidad and proportionately more than in any except Dutch Guiana. Despite the relatively slow growth of the population, the British Guiana Refugee commission reported that the colony could support "at least a million additional population." The capital and principal city is Georgetown (1943 pop. est., 73,171, of whom only about 1,400 were white). The settled area is largely along the Atlantic coast and the banks of the Essequibo and Demerara rivers and it has been estimated that as much as 64,000 sq.mi. of the whole area of the colony is almost entirely unexplored. Executive power is vested in a governor, assisted by an executive council and a legislative council, the latter body including 24 members, 3 of them officials and 21 nonofficials, 7 nominated and 14 elected. The colony is for some purposes regarded as part of the British West Indies and the tendency continued during the decade to move toward a closer administrative amalgamation of it with other British colonies in the Caribbean area. Governors during the decade 1937-46: Sir Wilfred F. Jackson, until July 4, 1941; Sir Gordon James Lethem, after that date.

British Guiana and its possibilities for development had been virtually ignored by the imperial government until events in 1937 compelled a closer attention on the part of the mother country. Serious labour disorders in that year in British Guiana, Trinidad, Jamaica, and elsewhere in the British West Indies brought about the appointment

in 1938 of a West Indies royal commission, under the chairmanship of Lord Moyne, to study social and economic conditions in the British colonies in tropical America. The commission made an exhaustive study, publishing its report in part in Feb. 1940. The commission's recommendations dealt mainly with the area as a whole. Despite wartime conditions, some of the proposals were embodied in the Colonial Development and Welfare act passed by the British parliament in July 1940. Under authority of this act, previous imperial loans totalling £190,149 made to the colonial treasury were written off, and an immediate grant of £52,000 for drainage and other developmental projects was made.

In the meantime, in the latter part of 1938, the British government had made a tentative offer of lands in the interior of British Guiana as a possible site for settlement of involuntary refugees from Europe, and in Feb. 1939 the British Guiana Refugee commission, which included experts on colonization, tropical diseases and sanitation, highway engineering, agronomy, soil ecology, and other aspects of tropical agriculture, made aerial and land surveys of three sections of the colony totalling more than 40,000 sq.mi. in extent. The region involved principally that south of lat. 5° and west of the Essequibo river, the corresponding areas east of that river and the northwest district. On the basis of this and other previous studies, the commission submitted a report which, in summary, declared that while not "ideal" for middle Europeans and not suitable for "immediate large-scale settlement," there were soils suitable for permanent agricultural exploitation and that natural resources made possible a correlated industrial development. The commission recommended immediate trial settlements of 3,000 to 5,000 young colonists, aided by skilled technicians. The cost of settlements of 5,000, including transportation to British Guiana, was roughly calculated at \$3,000,000 for two years. The Kanuku mountain district in the south was regarded as the bestsuited area of all those studied. Recommendations for an industrial centre in the vicinity of Bartica and for development of transportation routes into the interior were also made. The additional 1,000,000 people which the commission estimated the colony could support was arrived at on the basis of conservative estimates of 5 ac. of productive land per person (twice the usually accepted

standard), plus adequate financing and proper technical direction and supervision. These conclusions presumed a balanced and roughly self-sufficient economy carried on entirely by whites. Preparations for the proposed trial settlements were begun, but the outbreak of World War II in Europe in Sept. 1939 forced an indefinite postponement of the plans. Large-scale development proved impossible thereafter under wartime conditions.

The agreement between President Roosevelt and Prime Minister Winston Churchill in the summer of 1940, formalized by an exchange of notes dated Sept. 2, 1940, to exchange 50 U.S. over-age destroyers for 99-year leases on eight general sites in British Atlantic possessions, to be used by the U.S. as naval and air bases, involved British Guiana as the southernmost of those sites. Late in 1940, U.S. naval experts visited British Guiana to select a specific site for such developments in that colony. It was ultimately decided to establish a seaplane base near Suddie at the mouth of the Essequibo river and a patrol plane and squadron base (subsequently named Atkinson field) on the Demerara river, 25 mi. from its mouth; the latter had an aerodrome of 4,708 ac. The U.S. undertook active construction work in 1941 and formally took over the bases in July of that year. Base installations in British Guiana were not as strategically important as those in Trinidad, but they served to complete the southern extension of the arc arranged for Panama canal defense.

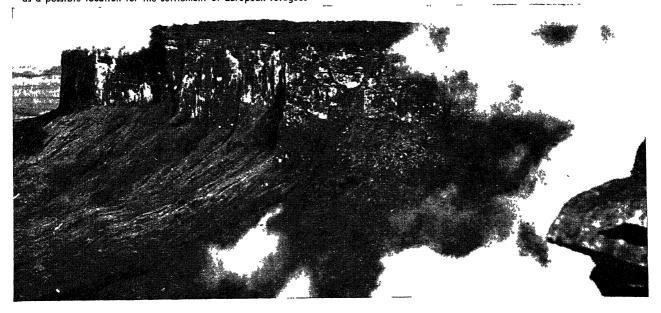
British Guiana felt relatively little political repercussion from the advent of the war in Europe, but economic consequences were considerable and serious. The chief early effects were the reduced exports of diamonds and certain other products; on the other hand, bauxite and sugar production and exports were considerably stimulated. Heavy wartime demands for aluminum made the extensive bauxite deposits of British Guiana among the most important strategic resources in the hemisphere. The violent fluctuations in British Guiana economy brought about by the war resulted in the extension of additional financial aid from the British treasury at various times. The colony, on its part, was responsible for increasingly large-scale contributions and loans in support of the im-

Terrain in the Mt. Roraima region of British Guiana inhabited by a "lost tribe" which was discovered by U.S. zoologists conducting an expedition there in 1939. The uncultivated area was suggested as a possible location for the settlement of European refugees

perial war effort. The imperial treasury in 1942 allotted a grant of \$400,000 for drainage and irrigation works to extend rice production. This meant that British Guiana, already the chief rice-producing area of South America and with 72,000 of its estimated 155,000 ac. of cultivated land devoted to that crop, might become an even more important factor in hemispheric rice production. U.S. need for rubber after 1941 resulted in the resumption of rubber production in British Guiana the following year, after an 11-year lapse. Technical assistance was provided by the U.S., who guaranteed purchase of all production through 1946 and offered a production bonus. The colonial government in 1945 aide \bar{d} in the establishment of a new industry, that of the manufacture of food yeast and animal yeast, undertaken on an experimental basis at Plantation Leonora. Consideration was also given to the establishment of a glass-manufacturing industry.

The chief obstacle to both agricultural and industrial development throughout the colony continued to be lack of transportation, both by railway and highway. No external land communications were available, although the visit to British Guiana in April 1942 by the governor of the Brazilian state of Amazonas served to focus attention again on the long-discussed proposals for a railway from the colony's border to Bôa Vista in Brazil. Attention was given the following year to the possible construction of a highway link connecting the colony with Brazil. Nothing tangible developed from either proposal during the decade. The government in 1945 was planning an extensive road-building program for the interior of the colony.

British Guiana was increasingly feeling the strain of war disruptions of trade and shipping by 1942, but was able to withstand the ill effects better than were her sister colonies in the West Indies. This was largely the result of the self-sufficiency program begun early in World War II. Government control of gasoline and power alcohol, subsidies for production of certain staple foods, and stringent restriction of nonessential imports were effected, however. The economic situation was aggravated in 1943 by prolonged rains and floods, the January-March rainfall being the heaviest recorded after 1880. Offsetting this



was the increasing attention being paid by that time to long-term and postwar development. Thus, imperial loans and grants were made in 1943 for drainage and irrigation projects aggregating £118,584, and for extension of the cattle industry, an airport at Georgetown, land settlement and other purposes. Moreover, the colonial office in London indicated that a "considerable number of largescale proposals" for British Guiana development were under discussion. The pace of long-range development planning under imperial colonial development grants was stepped up in 1944. These grants included a 20-year irrigation and drainage program involving 500,000 ac. and costing \$12,000,000, a \$3,000,000 wasteland development project along the Courantyne river and similar smaller projects, further government aid for the mechanization of rice cultivation and a \$200,000 airfield at Mackenzie. The government further stimulated air services in 1944 with the granting of subsidies for the inauguration of air services biweekly to the Mazaruni region and monthly to the Rupununi. A colonial-accumulated treasury balance of \$5,760,000 at the beginning of 1944 was held in reserve, earmarked against postwar adjustment difficulties. Government subsidies proposed for 1945, partially as a wartime measure for controlling living costs, amounted to \$1,931,925; the legislative council in 1945 appropriated \$996,240 for improvement of the rice industry. The government in 1945 gave much encouragement to farmers in

the selection of better seed, as well as in planting irrigation and drainage, in the hope that increased crop yields might soon make the colony almost self-sufficient in food.

Considerable political discussion occurred toward the close of the war period over the possibility of closer administrative and political union with near-by British colonies. British Guiana, after 1940, shared with the insular Caribbean colonies and British Honduras a common comptroller for development and welfare, along with advisers in special fields. British Guiana also fell within the jurisdiction of the Anglo-American Caribbean commission, created on March 9, 1942, to deal especially with "matters pertaining to labour, agriculture, housing, health, education, social welfare, finance and related subjects in territories under British and United States flags." Modification of the commission's organization and activities in 1945 to include participation by French and Dutch governmental representatives brought British Guiana into closer potential contact with Dutch Guiana and French Guiana. British Guiana sent representatives to the important West Indian conference held at Bridgetown, Barbados, from March 21 to March 30, 1944. The conference discussed projects for fisheries development (a matter which the British Guiana government in 1945 specifically sought to encourage), longterm public works construction by means of regional planning boards and an international planning commission as a subsidiary of the Caribbean commission, the betterment of standards of living and the increase of local food production, postwar industrial development, and

other problems. The conference proposed the development of secondary industries where practicable and suggested economic surveys and development of resources and transportation in British Guiana as well as else-

where. Oliver Stanley, minister for the colonies, addressed a proposal to the governor of British Guiana, along with those of other British Atlantic colonies, in March 1945, for consideration of the advantages of political federation. A federation of the sort he proposed might ultimately attain a status of self-government comparable with that of a dominion and, in the meantime. it would probably result in an increase of efficiency and economic stability and in lessened administrative costs. The adoption of a new parliamentary Colonial Development and Welfare act, which took effect April 25, 1945, resulted in increasing the sums available from the imperial treasury for grants and loans in the Caribbean area by more than 100%. A further evidence of at-

•	1	938	19	741	15	44
	Value	Amount or	Value	Amount or	Value	Amount or
İtem	(000's omitted)		00's omitted)		(000's omitted	
Exchange rate		£1 = \$4.889		£1 = \$4.031		£1 =\$4.035
Finance						
Government revenues					£2,642*	
Government expenditures	(\$6,369) £1,312				(\$10,662) £2,331*	
Matter 1 July	(\$6,416)				(\$9,404)	
National debt	£4,468 (\$21,842)				£4,478	
Transportation	(421,042)				(\$18,068)	
Railroads		79 mi.				
_ Highways		881 "				
Communication						
Telephones		2,352				2,800
Telegraph lines		317 mi.				317 mi.
Radio sets		2,09 <i>7</i>				5,035
Bauxite		107 000				
Gold		497,292 tons 38,482 oz.			,	987,845 tons
Diamonds		31,691				18,019 oz.
		carats				16,019 carats
Crops						curuis
Sugar cane		216,604 tons				
Rice		46,478 "				
Livestock Cattle						
Sheep		133,351†		140,924		
Swine		31,895†		33,773		
Forest Products		27,248†		22,889		
Shingles	•	2,754,266				
Hardwood timber	-	922,204 cu.ft.				
Boards and scantlings		530,042 bd.ft.				
Balata		245 tons				
Exports Total						
	£2,777 (\$13,578)	•••	£4,083 (\$16,463)	•••		
Sugar	£1,578 (\$7,716)	202,000 tons	£1,721 (\$6,938)	•••		
Bauxite	£421	415,000 "	• • •	• • •		
Gold	(\$2,058) £215	40,000 oz.				
	(\$1,050)	40,000 02.	•••	•••		
Imports						
Total	£2,213 (\$10,821)	•••	£3,584 (\$14,451)	•••		
Machinery	£198 (\$969)	•••	£584 (\$2,354)	•••		
Flour and grain	£189 (\$923)	186,000	£208	186,000		
Cotton piece goods	£130 ;	bags 7,064,000 yd.	(\$840) £209	bags 7,750,000		
Metal manufactures	(\$636) £105	•••	(\$844) £236	yd.		
Education	(\$514)		(\$951)	•••		
Education Primary sehecia			•			
Primary schools		239		238‡		246*
Secondary schools		53,373		55,707‡		55,076*
** * * *		7		7‡		7*
*1943. †1939.		‡1940.				

British Guiana: Statistical Data

tention from the mother country and of a trend toward unification was seen in the creation in 1945 of a department of civil aviation to serve all British West Indian colonies.

Representatives from British Guiana participated in a conference which met in the U.S. Virgin Islands, beginning Feb. 21, 1946, and included representatives of the various British, U.S., Dutch and French colonies and possessions in tropical America.

A disastrous fire on Feb. 23, 1945, in the business section of Georgetown resulted in damage estimated at \$10,000,000 and destroyed many of the important industrial properties as well as the well-known museum of the Royal Agricultural and Commercial society, containing rare specimens of wildlife.

(See also West Indies, British.)

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British Honduras

British crown colony on the Caribbean side of Central America, British Honduras is bounded on the north by Yucatan (Mexico), on the west by Guatemala, and on the east and south by the Caribbean sea. The colony was formerly known as Belize (or Balize) and is called Belice by the Spanish-speaking neighbour states in Central America. Area (including about 212 sq.mi. of cays), 8,598 sq.mi.; the area in 1946 was still technically in doubt because of the existence of a claim by Guatemala to a large fraction of southern British Honduras. Pop. (1931 census), 51,347; later pop. estimates were as follows: (1938) 57,767; (1939) 58,759; (1940) 57,061; (1941) 61,068; (1942) 61,723; (1943) 62,512; (1944) 63,390. The capital and principal port is Belize (or Belice); its population by the 1931 census was 16,687; (1941) 17,289 and by a 1945 est., 18,188. Other towns include Stann Creek (2,844); Corozal (2,197); El Cayo (1,260); Benque Viejo (1,500). The population was estimated by one source to be increasing at the rate of about 800 a year. The annual birth and death rates in 1944 were 32.6 and 18.2, respectively, per 1,000. Purebred white inhabitants numbered less than 4%; the remainder were of mixed descent, and the large majority hybrids of Negro slaves, native Indians and white settlers.

The principal races of British Honduras,-in their order of predominance, are the Negro, Maya-Indian, Spanish-American, Carib-Indian, Scotch and English. English is the commercial and official language for the whole colony but Spanish is generally understood and is often spoken in the north and west.

Executive power was vested in a royally appointed governor, assisted by an executive council of seven members (including three officials and four nominated nonofficials), and a legislative council with a membership of 14 (six officials and eight nonofficials, six of the latter being elective). Governors: Sir Alan C. Maxwell Burns (1937–41); Sir John Adams Hunter (1942–46).

The frontier between British Honduras and Guatemala had long been regarded as definitively settled under a treaty made between the latter country and Great Britain in 1859, but in 1939 Guatemala reopened the entire question on the ground that Britain's noncompliance with the provision that it construct a means of transportation through British Honduras to the Guatemalan capital had invalidated the entire treaty. As defined in 1859, the boundary followed the Sarstoon (Sarstun) river from the Bay of Honduras to Gracias à Dios falls, ran northward in a straight line to Garbutt's falls on the Belize river, and from there due north to the Mexican frontier, which followed Blue creek and the Río Hondo to its mouth in Chetumal bay. The Guatemalan claim involved approximately two-fifths of British Honduran territory. In the second foreign ministers' conference, at Havana, Cuba, in July 1940, where the principal question for discussion was that of the attitude of the republics of the hemisphere toward the European colonies in the new world in the event that an attempted change of sovereignty and control over them should be made (by nazi Germany), Guatemala made a reservation with regard to British Honduras in agreeing to the proposed regime of provisional administration which the conferees suggested should be set up under certain contingencies. However, Guatemala in 1941 announced that, for the duration of World War II, it would not press its claim to the portion of British Honduran territory. The controversy was partially reopened when the Guatemalan government announced on May 3, 1944, that it would expect the U.S. to use its good offices to bring about a settlement of the matter. Following the Guatemalan revolution of Oct. 20, 1944, it was said that the new governmental junta in that republic planned to revive in active form its claim to a portion of the territory of British Honduras. Further diplomatic correspondence over the issue took place in 1945, and the government of Great Britain on Jan. 14, 1946, offered to submit the dispute over British Honduras to the international court to be organized under the United Nations. Guatemala on Jan. 16 agreed to this proposal.

Arrangements were made early in 1940 for the settlement of 80 European refugee industrial families at Ericatown in the west central highlands. They were expected to engage in specialized handiwork. At later stages in World War II, attention was directed to British Honduras as a possible location for large-scale refugee settlement, but nothing tangible developed from such proposals. Consequences of the war were felt from a relatively early date, especially in the form of economic dislocation, but the cumulative effects became especially serious by 1941. The direct effect of war disruption of colonial trade resulted in considerable unemployment and consequent economic depression. These factors were intensified by a hurricane in Nov. 1941 which destroyed an estimated 45% of the unpicked citrus crop. Efforts were directed by the colonial government in the meantime toward increased production of foodstuffs, especially rice, corn and beans, with the object of reducing the need for importations, which had been seriously curtailed by the reduced shipping available. The export market for fruits, an important though not the principal item in the colony's whole export trade pattern, was almost entirely lost by 1942 except for dehydrated fruits and other concentrated forms. Rubber development was stimulated during the same year, however, with a U.S. Rubber Reserve company contract to purchase all British Honduran production until the end of 1946. Later de-

velopments in the rubber industry in that colony made its future appear precarious, especially as it had been conducted on a somewhat artificial basis.

The already critical economic situation of British Honduras was further disturbed in 1942 by the added shipping disruption caused by the serious submarine menace, which brought the war to the colony's doorstep. In June of that year, 15 persons were arrested as axis agents charged with furnishing axis submarines with information and supplies. The leader of this group, which had close liaison with a spy ring in Panamá, was identified by police as a resident of British Honduras. It was alleged that coastal ships had been used to supply submarines with petroleum during night-time rendezvous and that clandestine radio transmitters operating from British Honduras had sent information on shipping movements to lurking submarines.

The shipping shortage continued to seriously affect British Honduras in 1943. The foresighted policy of licensing imports, begun by the colonial government in 1941, had cushioned the effects by enabling the government to bring about the importation of a stock of essential commodities, with the result that British Honduras was better supplied than most British Caribbean colonies well through 1942. The cost of living steadily increased in 1943, however, and rationing of rice, a staple article in the diet of the poorer classes, proved necessary. Limits on profits were also imposed by the colonial government. Some shortage of labour occurred in the colony during the year, chiefly because more than 3,000 workers were recruited for employment in the Panama Canal Zone on wartime construction projects being undertaken there; an additional 600 workers were taken into United Kingdom services of various sorts.

The colony was concerned in 1945 primarily with problems of economic rehabilitation following the end of World War II. After the end of fighting in Europe the shipping shortage was eased, and hope was expressed in government circles that such facilities would be restored to near normal by 1946. Minor excitement was caused by a warning given July 19, 1945, that German residents in the colony would join with Germans in the department of Alta Verapaz in Guatemala to create a dangerous situation. The author of the report, one Ramón Blanco, appeared later to have spoken without foundation.

British Honduras was concerned in the closing stages of the war with consideration of the possibility of closer political and economic co-operation with other British colonies in tropical America, perhaps ultimately leading to a form of political federation. Although the colony remained nominally independent of all other near-by British colonies, it tended to assume a closer relationship with them during the decade. From 1940 on, British Honduras, along with the six British colonies in the West Indies and with British Guiana, was served by a common comptroller for development and welfare, together with expert advisers in special fields; this development was provided for by the Colonial Development and Welfare act, passed by the British parliament in July 1940. The act in turn was an outgrowth of the exhaustive survey made in 1938-39 by the West Indies royal commission, headed by Lord Moyne and commonly known as the Moyne commission, which was created to examine economic and social conditions in the eight British colonies in the area, and to make recommendations. The commission's report, partially published in Feb. 1940, proposed the creation of a West Indies welfare fund with a liberal parliamentary grant.

Problems of labour relations, acute in British Honduras as well as elsewhere, were emphasized, and the commission made comprehensive proposals dealing with them. Political problems recognized by the commission included the long agitation for a greater degree of self-government and a reduction in the qualifications required for election to membership on the various legislative councils. The ultimate objective of complete political federation, the commission felt, should be approached slowly, although Oliver Stanley, minister for the colonies, addressed a communication in March 1945 to the governor of British Honduras, along with the governors of the other British colonies concerned, urging early consideration of the advantages of political federation.

The Moyne commission's report served as the basis for the parliamentary act of 1940, which in large measure regulated financial relations between the colony and the mother country until it was superseded by a new Colonial Development and Welfare act. The latter act, which took effect April 25, 1945, provided for considerably more generous grants for subsidy and loan to British Honduras and the other Caribbean colonies. Representatives of British Honduras were also engaged in the latter stages of the war in discussion with those of other British colonies in the general area of such common problems as the establishment of a common currency on a decimal basis, a customs union, uniform quarantine regulations, etc. Two delegates from the colony attended the meeting of the West Indian conference, which held its initial meeting at Bridgetown, capital of Barbados, from March 21 to March 30, 1944. The Bridgetown conference discussed a wide range of economic measures conditioning postwar rehabilitation, including increase of local food production and the rais-

В	British Honduras: Statistical Data							
		1938	1942					
	Value		Value					
Item	(000's omitted)	Amount or Number	(000's omitted)	Amount or Number				
Exchange rate		£1 = $$4.889$		£1 =\$4.035				
Finance								
Government revenues .	£257		£391*					
Government expenditures	(\$1,258) £274 (\$1,338)		(\$1,576) £378*					
National debt	£683		(\$1,524) £620*					
Crops	(\$3,337)		(\$2,500)					
Sugar cane		12,320 tons† 2,371 " †						
Forest products								
Mahogany logs Mahogany lumber		814,219 cu.ft.† 228,060 "						
Cedar logs		414,000 bd.ft.†						
Cedar lumber		10,000 "						
Exports		880,455 lb.†						
Total	£667		0010					
	(\$3,263)	•••	£310 (\$1,252)	•••				
Cedar and mahogany			•					
(lumber and logs)	£218 (\$1,067)	1,077,598 cu.ft.	£168 (\$676)	538,484 cu.ft.				
Chicle	£59 (\$290)	440 tons	£88 (\$356)	452 tons				
Bananas	£58	776,172	£9	97.414				
Grapefruit	(\$283) £1 <i>7</i>	bunches	(\$35)	bunches				
Orapenon	(\$84)	2,256 tons	£15 (\$59)	903 tons				
Imports	(40.7		(423)					
Total	£819	•••	£982					
Lumber (rough and	(\$4,004)		(\$3,964)	•••				
dressed)	£148 (\$724)	644,311 cu.ft.	£198	577,081 cu.ft.				
Wheat flour	£39	4,134 tons	(\$798) £55	45,041 tons				
Cotton cloth	(\$193) £34	1,622,285 yd.	(\$221) £52 1	,325,585 yd.				
Milk	(\$168) £30	1 001 -	(\$210)	•				
	(\$148)	1,031 tons	£50 (\$203)	747 tons				
Education			••					
Elementary schools Enrolment		106		106				
Secondary schools		10,021		10,000				
Enrolment		5 456		5				
*1941.		450		500				
†Exports only.								

ing of the standard of living in the various colonies, the postwar absorption of veterans and war workers, longrange public-works programs and other matters. The conference recommended the furthering of secondary industries to satisfy local needs, where they might prove feasible and proposed economic surveys and the development of transportation and resources for British Honduras and certain other areas. The Anglo-American Caribbean commission, established by joint action of Great Britain and the U.S. on March 9, 1942, assumed a measure of jurisdiction over British Honduras, insofar as its responsibility for research and recommendation went; the further integration of British Honduras with the other colonial possessions in tropical America appeared likely with the expansion of the work and organization of the A.A.C.C. in 1945 to include representatives of the Netherlands and France with regard to their Caribbean possessions. All four colonial powers, including representatives of British Honduras, participated in a joint conference held in the U.S. Virgin Islands, beginning Feb. 21, 1946.

Domestic constitutional changes also took place in British Honduras in the latter part of the decade. Members of the Belize municipal council were elected by popular vote for the first time in Dec. 1944. This was a step in the direction of a long-agitated increase in the degree of elective representation. A further step came in 1945, when the legislative council began consideration of a new draft constitution designed, among other changes, to increase its elective membership. (See also West Indies, British.)

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British Isles

See Great Britain & Northern Ireland, United Kingdom of.

British Legion

The British legion was founded in July 1921 by Field Marshal Earl Haig, who succeeded in uniting into one body a number of ex-servicemen's organizations which had come into existence during the latter part of World War I. The chief objects of these associations had been to secure the statutory right to pensions of those disabled in war service, to see that the pensions were adequate, that proper provision was made for the dependents of the fallen and of the disabled, and that all possible assistance was given in the resettlement of ex-servicemen and women. These continued to be objects of the new united organization, and to them Lord Haig added the preservation of the spirit of comradeship and service, engendered in war, for the benefit of the nation in peace. The legion was organized in areas covering the whole of England, Wales and north and south Ireland. In Scotland the legion was made an independent body, closely affiliated to the British legion. In each area there county councils were established, and in the case of the large towns, district councils, and under these came the branches. Every man and woman who had served in the forces became eligible for election to membership of a branch, and every member of a branch was given an equal vote, whatever his rank may have been in war. Branches, districts, counties and areas continued to hold annual conferences at which the officers for the coming year were elected and recommendations made as to future policy. The governing body of the British legion remained the national executive council. Two representatives of each area were elected annually at the area conferences to represent the area on the council. Each Whitsuntide, annual conferences continued to be held, to which every branch was entitled to send a delegate and to submit resolutions for consideration. At the annual conference the nominations of areas to the national executive council were confirmed, the officers of the legion elected, the work of the council reviewed, and the policy of the legion determined.

The officers of the legion were the president, the chairman and vice-chairman of the national executive council, and the treasurer. The business administration was directed by a general secretary. Under the constitution, chairmen who had held office for three years became ex officio members of the council. In 1946 there were five such ex officio members.

Simultaneously with the formation of the legion, a women's section was established, the female relatives of those who had served being eligible for membership. The objects of the section were to assist the work of the legion in every possible way and in particular to care for orphan children and the widows of the fallen.

In 1946, the number of branches of the legion was 4,700, and the number of branches of the women's section 2,600. Each branch decided the rate of subscription for its members, but for every member an affiliation fee of one shilling and six pence was paid to headquarters, of which one shilling was retained to meet the cost of general administration and six pence was returned to areas for their administration. The benevolent work of the legion was still mainly financed by Poppy day, an annual collection made on or about Nov. 11, the date of the armistice of 1918.

For the first Poppy day in 1921 the poppies were made in France and brought to England. The number proved to be quite insufficient to meet the demand. Major Howson then established a factory for the making of poppies by disabled ex-servicemen, and this was taken over by the legion in 1925. In 1946, about 400 disabled men were employed in the manufacture of some 45,000,000 poppies. This annual collection steadily increased its hold on the public. The first Poppy day produced just over £100,000, that of 1945 just over £1,000,000. The spending of this money continued to be supervised in part by some 4,000 service committees of voluntary workers dealing mainly with cases in which help to individuals was needed, and in part by headquarters, which established national organizations for the benefit of ex-servicemen. These included a large sanatorium for ex-servicemen at Preston hall, near Maidstone, Kent, with a convalescent home at Bournemouth; another sanatorium for ex-servicewomen at Nayland, Suffolk; the Poppy factory; a factory for the manufacture of Welsh tweeds by disabled men in Wales; the provision of rooms especially rented for disabled men; a pension fund for the prematurely aged; and an organization for the sale of goods made by disabled men in their own homes. The legion also financially assisted other organizations for the disabled, particularly St. Dunstan's, for blinded servicemen. To this it continued to make an annual grant of £50,000 a year. Besides this the legion had, by constant pressure on successive governments, radically improved the pensions of the disabled and worked consist-

ently for preference in employment for those who had served in war, while its members remained active in promoting and aiding the civic life of the communities in which they lived and worked.

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British Malaya

See MALAYAN UNION; WORLD WAR II.

British Museum

The years from 1937 to 1946 were all war years in the history of this world-famous museum in London, England. Those before 1939 were largely occupied with general preparations for protecting the collections in the event of war; from Aug. 1939 until May 1945 the administration was actively engaged in putting into practice these principles of safety; and the last years saw the beginning of the slow process of postwar recovery.

The two institutions administered together at Bloomsbury, London-the unique national library and the national museum—continued to serve different public uses. The library is primarily a service supplying current literature for immediate use; the museum is mainly an instrument of historical and artistic education. It was therefore possible to withdraw the whole of the museum material and to place it in protected storage, but the library served vital wartime needs, and its public service was maintained without other interruption than a few brief closures for adjustments after damage. The protective methods adopted were evacuation to safe localities of portable material and storage of the rest, consisting mostly of heavy sculpture, in blast- and splinter-proof shelters on the ground floors of the museum. These measures were so effective that no evacuated or protected object was lost or damaged. The books, which were necessarily exposed to air attacks, were not so fortunate. One bookstack containing some 200,-000 volumes was burned out, and 40,000 volumes of newspapers were destroyed. The repositories first chosen for evacuation were the national library of Wales at Aberystwyth and some country houses in the midlands and the north of England, lent by their owners for that purpose. An unused tunnel of the London underground railways was also prepared by the ministry of works for the reception of some materials. All the manuscripts, prints and drawings, and large numbers of antiquarian books were evacuated. Preparation had been so complete that the material of first importance was removed from the museum in the week before the war began. It soon became evident that the localities which had been considered safe from air attack were not so, and the government was asked by the museum to provide large bomb-proof storage for the collections dangerously placed in country houses. This urgent need was met by the ministry of works with the conversion of a worked-out stone quarry under go ft. of rock into an air-conditioned repository.

The members of the staff who were not serving in the library, with the armed forces or in government departments were employed in day and night watch of the museum buildings and the various repositories. But beside its disabilities, the wartime stoppage brought an opportunity of viewing in isolation some problems of administration which had long been insistent. Plans were prepared for

future improvements in accommodation to be co-ordinated with the repair of war damage. In particular, provision was made for the inevitable growth and adequate service of the national library.

Many of the upper exhibition galleries were destroyed by fire, and major building operations could not even be begun by the end of 1946. Minor repairs, consisting mainly of replacing blasted windows and roof-lights (more than 50 rooms and galleries were so damaged), could hardly be completed in that time. The library services were fully restored, but only a small part of the museum was reopened to public use. There again the opportunity was offered of turning wartime disabilities to advantage. Evacuation had provided empty galleries, and the largest and most modern of them was prepared for the display of representative material from the departments of antiquities and ethnography. This comprehensive exhibition in a single gallery of the most significant documents of history and art satisfied a public need which had long been recognized, but which normally would have been forced to await the provision of a new building. As a permanent feature of a large museum it was an important and successful innovation.

Some of the most valuable acquisitions in the history of the museum were made in these ten years by gift, bequest or purchase. The trustees' parliamentary grants for this purpose were largely withdrawn during the war, but generous aid was given by the Friends of the National Libraries and the National Art-Collections fund. Outstanding additions to printed books and manuscripts were the Ashley library of fine editions of English authors (bought 1937), the Paul Hirsch music library (bought for £120,000 in 1946), the Lacock Abbey Magna Carta (given by Miss M. E. Talbot, 1945), 47 mediaeval MSS from the Henry Yates Thompson collection (given by Mrs. Yates Thompson, 1941), the Bohun psalter and book of hours (bought 1943). Sporting prints and drawings from the Schwerdt collection were bought in 1939, and Colonel C. W. Cruickshank gave his collection of military prints in 1944. A complete collection of British South African postage stamps was given in 1944 by Mrs. Cunningham, daughter of the collector, E. Mosely, and the great collection of Greek coins formed by Dr. A. H. and Miss M. Lloyd was given in their memory by Mrs. Lloyd in 1946. Important Egyptian antiquities were bequeathed by Sir Robert Mond in 1939, and Egyptian and Oriental works of art by Oscar Raphael in 1942. A large part of the Cranmore ethnographical collection of H. G. Beasley was given in 1941 by Mrs. Beasley. The Southesk collection of Babylonian and oriental cylinder-seals and the Hellenistic Portland vase were bought in 1945. A large hoard of Roman silver plate found at Mildenhall in Suffolk was acquired as treasure trove in 1946, and the rich gold and silver treasure and other furniture of a 7th century royal Anglian ship-burial at Sutton Hoo in Suffolk was given by Mrs. E. M. Pretty in 1939.

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(E. J. F.)

British Pacific Islands

See PACIFIC ISLANDS, BRITISH.

British Possessions in the Mediterranean

See Cyprus; Gibraltar; Malta.

British Somaliland

See British East Africa.

British South African Protectorates

The three protectorates-Bechuanaland, Swaziland and Basutoland-owed their origin to the century-old difference of opinion about the rights and the position of African natives as shown in British policy on the one hand and South African, particularly Boer, policy on the other. With the increasingly restrictive legislation of the Union of South Africa, which excluded natives from attaining, for the time being, a status of equality with the white man, the difference between union territory and the protectorates became all the more pronounced, Britain being pledged to safeguarding above everything else the interests of the natives. The three districts did not become protectorates in the true sense of the word since there was no clear-cut difference between external relations (to be cared for by the protecting power) and the internal affairs (to be administered irrespective of the latter); they were better described as British colonies which had been placed, for convenience's sake, under the dominions office-so as to smooth the constant contact with the Union of South Africa-and which aimed at the establishment of indirect rule through native tribal authority under the guidance of three resident commissioners under a single high commissioner, the latter having his seat in union territory, at Pretoria, while the three resident commissioners worked at Mafeking (for Bechuana), Mbabane (in Swazi) and Maseru (in Basuto).

Bechuanaland, never surveyed as a whole, covers some 275,000 sq.mi. of tropical Africa bordering on the Union of South Africa in the east and south, on the union mandate of South-West Africa in the west and on Southern Rhodesia in the north east. Population, according to the 1936 census (figures for 1921 in parentheses): natives 260,064 (150,185); other coloured 3,793 (1,055); Europeans 1,899 (1,743).

Swaziland (cap. Mbabane) covers 6,704 sq.mi. bordering in the east on Portuguese Mozambique as well as on the Union of South Africa, which also constitutes its neighbour in all other directions. Population, according to the 1936 census (figures for 1921 in parentheses): natives 153,270 (110,295); other coloured 705 (451); Europeans 2,740 (2,205).

Basutoland (cap. Maseru) covers 11,716 sq.mi. and is wholly surrounded by union territory; it is 5,000–11,000 ft. above sea level. Population (1936 census) (figures for 1921 in parentheses): natives 559,273 (543,078); other coloured 1,604 (1,241); Europeans 1,434 (1,603).

High commissioners during the decade 1937–46: Sir William Clark (Jan. 1935–July 1939); Sir Edward Harding (July 1939–Feb. 1941); Lord Harlech (Feb. 1941–Oct 1944); Sir Evelyn Baring (after Oct. 1944).

Bechuanaland, well described as a marginal ranching country, continued to suffer from unreliable rainfalls which -quite apart from the Kalahari desert-made agriculture precarious. Only the Bakgatla tribe, less so the Bangwaketsi and Bamalete, could be said to be fairly well housed: they lived in townlike settlements. With no sanitation and only 14 qualified doctors for the whole population (total number of hospital beds, including European, was 183 in 1940; in-patients treated were 2,890) progress was slow, even if the increase in population figures was continuing at a gratifying rate. There was reason to believe that good underground waters exist; hence the great importance attached to the grant of £25,000 made by Great Britain in 1944 for a water survey. Another £27,500 was granted for increased educational facilities; there were 131 schools with 15,390 pupils, an unsatisfactory number since

the majority of the young boys spend most of their time with the cattle beyond the reach of schooling. Some 10,ooo men, moreover, regularly worked abroad. The British district officers, mostly recruited from the police, had little influence since the tribal chiefs, as in pre-British days, claimed absolute power, could call on tribal labour and had the right of tax collection. In 1938, native treasuries were established (native tax stood at $f_{1.10s.od.}$, including a contribution to the native fund for educational advance). While the elected European advisory council met twice yearly, the native advisory council, established in 1922, was nominated, met once a year and proved quite ineffective as a true expression of tribal wishes. While the natives relied chiefly on their cattle, the Tati district, with 18 producing mines, witnessed an increase in European-owned gold production.

Swaziland, two-thirds of which had been given to some 500 European concessionaires, had almost been lost to the native population when the British took over in 1906. In 1946, land was still being re-bought to settle landless natives, the last of these schemes providing some 364,609 ac. (229,160 of which were regained from European owners, mostly absentee landlords) which were paid for with the help of a special grant of $f_{160,000}$ made by the Colonial Development fund. Another grant, of £37,500, made in 1941, was used for a geological survey. Unlike Bechuanaland, with its south to north railway line from the Union of South Africa to the Rhodesias and beyond, Swaziland had no railway approach except by road to the railheads in Mozambique or union territory. A speedy increase in educational facilities was being provided (there were 278 schools with some 9,000 pupils during the decade) since a school grant of £130,000, terminating in 1947, was made by the British government. Some 10,000-15,000 young men regularly worked abroad and were thus withdrawn from tribal life during a most important part of their life. Native tax went up to £4.10s.0d., according to the number of wives; as their main occupation was cattle rearing, and as the union had banned cattle imports, at the rate of taxation the economic need for continued work in the mines across the borders remained. While there was a native advisory council of the so-called "Induna" meeting at times under the paramount chief, power rested mainly in the latter's hands. Asbestos manufacture began in Swaziland after World War I, reaching in 1941 the value of £500,000.

Basutoland, the South African "Switzerland," remained the only one of the three districts totally surrounded by territory of the South African union; yet it was by far the most advanced and most independent minded: The whole of Basutoland continued in native hands, thanks to the protecting power which refused to alienate any of it; neither was there any crown land. With the rapid increase in population, however, land became scarce, even high mountain valleys being grazed and used; soil erosion moreover played havoc: tree-planting, begun in earnest in 1942, was completing the drive against this serious danger, which was first met by a special grant of $f_{160,000}$, given by the British government in 1937, for the construction of terraces and dams and the sowing of thatching grass and lucerne; at least 15,000,000 trees had been planted in village woods. Otherwise the land was well suited for agriculture. Wool, classed from 1937, was proving a steady source of income. Of the cattle none could be exported for slaughter owing to South African restrictions (in 1920 cattle export had brought more than £100,000). "The water,"

British South African Protectorates: Statistical Data										
item	Value (000's omitted)	1938 Amount or Number	Value (000's omitted)	Amount or Number	Value (000's omitted)	* Amount or Number				
Exchange rate Great Britain	- ,	£SA 1.011 = £1 £SA 1 = \$4.841		£SA 1 = \$3.98		£SA 1 = "\$3.				
BASUTOLAND										
Finance Government revenues	£415				£480*					
Government expenditures	(\$2,028) £361 (\$1,765)				(\$1,938) £381* (\$1,536)					
Transportation Railroads						1 mi.†				
Highways		502 mi.				782 mi.†				
Corn		87,375 tons 25,781 tons		52,763 tons‡ 18,219 tons‡		•••				
Wheat		19,781 fons		16,449 tons‡		•••				
Sheep				1,597,887 565,554						
Cattle	£397		£525§	470,040						
Wheat and wheat meal	(\$1,944) £154	15,000 tons	(\$2,115) £191§	22,000 tons§						
	(\$754) £124	-	(\$771) £197§	4,000 tons§						
Wool	(\$606) £740	3,000 tons	(\$793)	4,000 101138						
Imports—total	(\$3,627)	•••								
General merchandise	£670 (\$3,284)	•••								
Cattle	£24 (\$118)	•••								
Education	(4110)	848								
Elementary schools		69								
All students		82,941[
BECHUANALAND Finance	0070				£200±					
Government revenues	£273 (\$1,338) £263				£300* (\$1,244)					
Government expenditures	£263 (\$1,288)				£260* (\$1,050)					
Transportation Railroads		396 mi.								
Highways		2,048 mi.								
Gold		19,111 oz. 1,127 oz.		[18,015 oz. 1,206 oz.						
Livestock Cattle		649,400								
Sheep and Goats	Cooo	438,700								
Exports—total	£208 (\$1,01 <i>5</i>)	•••								
Gold	£122 (\$597)	•••								
Cattle	£52 (\$252)	•••								
Imports—total	£333 (\$1,629)	•••								
General merchandise	£304 (\$1,486)	•••								
Education European schools	(4.7	12¶		115						
Students		iiż¶		189						
Students		1173		139 15,906						
SWAZILAND Finance										
Finance Government revenues	£119		£155‡		£319					
Government expenditures	(\$580) £150		(\$624) £160‡		(\$1,288) £299					
National debt	(\$732) £460 (\$2,250)		(\$646) £95‡ (\$384)		(\$1,208) £51 (\$205)					
Transportation Highways		800 mi.								
Communication Telephones		94				131				
Telegraph lines		390 mi. 105				424 mi.				
Minerals Asbestos				20 804 4						
Tin (cassiterite)		195 tons 1,246 oz.		20,804 tons 165 tons 1,079 oz.		32,659 tons 86 tons 2,299 oz.				
Crops Corn		6,504 tons		205 tons						
Tobacco Livestock		161 tons								
Cattle		407,460 140,000		433,288 142,000		473,911 25,448				
Exports—Total	•••	•••		•	£1,078 (\$4,351)					
Slaughter stock	£43 (\$210)	3,000 tons			£114	8,000 tons				
Metallic tin	£33	195 tons			(\$462) £26	86 tons				
Imports—Total	(\$160) £319	•••			(\$106)					
General merchandise	(\$1,278) £109 (\$4 41)	•••								
Education European schools	(4 +4)	7 ¶		10						
Students		3549		10 377						
Native schools		4,975¶		219 8,263						
*1943. †1945.	‡1942.	§1941. [1939.	¶1937							

said the official Annual Report for 1938 "is invariably infested from surface pollution"; yet there were, in 1940, only 324 hospital beds available (medical staff was 11, in-patients numbering 5,139). A costly leper settlement, requiring some £20,000 a year, maintained some 700 inmates. There were over 800 schools by 1944 with some 85,000 pupils, a figure which would be raised only if the habit of cattle grazing on unfenced landwith the need for constant attendance by the young boys of the tribes-could be altered.

Adult education too appeared to be extremely difficult through the absence of over half the male population working mainly in the mines of the Witwatersrand.

These men were not only missed by their tribe during their best years—even if they sent some money and parcels home and enabled the tax demand to be fulfilled—but also they not infrequently constituted a real danger to tribal life (according to Sir Alan Pim's report, a large proportion of the Johannesburg native prostitutes were Basuto).

No mineral development had so far taken place in the territory, but a preliminary geological survey had been carried out from 1938. Bridle paths too had been renewed after that year. The native council (*Pitso*) of 94 natives chosen by the paramount chief and 5 nominated by the resident commissioner had not yet acquired representative character.

As from April 1, 1946, native treasuries, similar to those of Bechuanaland, were introduced in accordance with Sir Arden Clarke's scheme.

This involved the introduction of salaries for all chiefs, who became responsible for tax collection, and a reduction of the number of native courts from 1,340 to 117 (fines were a source of income for the chiefs, an undesirable feature now abolished). Chiefs now held two warrants, one as administrators and one as judges, either of which they might lose if abused. Native tax stood at £1.5s. rising to £3.15s. according to the number of wives.

Part of the income of all three protectorates derived from the Johannesburg agency, strengthened in 1938, to collect there and then tax from the protectorate workers who had been recruited for work in the mines; another part took the form of a percentage contribution from the customs income of the union with which the districts had been forced to live in a customs union, thus having to follow the tariff policy of the Union of South Africa irrespective of their own needs.

In July 1939 the chief of the Basutos died; he was followed by Seeiso Griffiths, whose sudden death in Dec. 1940 led to the regency of Chieftainess Mantsebo. Of the Bechuana chiefs, Tshekedi was by far the most remarkable. During World War II the chiefs went out of their way to support the British government, making repeated voluntary contributions through special war levies: 19,000 Basuto, 3,800 Swazi and 9,500 men from Bechuanaland served in the African pioneer corps through all the African and middle east campaigns; another 2,500 men from the 3 protectorates entered the native military corps of the union.

Externally, their main preoccupation remained the fear of losing their fundamental rights, enjoyed under British protection, and of being reduced, through forcible transfer, to the status of the natives in the Union of South Africa. In 1937 discussions between the then prime minister of the union, General J. B. M. Hertzog, and the dominions secretary, Malcolm MacDonald, led to the establishment of a standing joint advisory conference (consisting of the three resident commissioners on the one hand, the union secretary for native affairs and two advisers on the other.) By the end of 1946, the memorandum on the future of the protectorates, drawn up by this conference and sent to the British government, had not so far been published. During World War II the question remained in abeyance. In March 1944, however, Field Marshal Jan C. Smuts complained about these "little territories" which, he said, were "sandwiched" in between union territory. Before leaving for San Francisco, when he repudiated the idea of annexations generally, he declared: "The destination of these territories is that they will become South African territory." In the British view, this could happen only if and when the natives, to the propagation of whose interests they stood pledged, would be secured a brighter future within such a framework than without. (See also British EMPIRE; SOUTH AFRICA, THE UNION OF.)

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(F. W. PK.)

British-U.S. War Boards

Combined Production and Resources Board.—The Combined Production and Resources board was created by President Franklin D. Roosevelt and Prime Minister Winston Churchill on June 9, 1942, to complete the or-

ganization needed for the most effective use of the combined resources of the United States and the United Kingdom for the prosecution of World War II. On Nov. 10, 1942, the board was expanded to include a Canadian member.

It was the function of the board to co-ordinate the war effort of the member countries, and as appropriate, of other United Nations, in the production, allocation and supply of those products (other than raw materials and foodstuffs) which required combined planning in order to meet military and essential civilian requirements. It was also charged with responsibility for determining availability and sources of supply for finished products (other than raw materials and food) required to meet the needs of liberated areas.

The three member governments officially terminated the board on Dec. 31, 1945. Prior to that time most of the board's commodity committees had been dissolved following the termination of hostilities, but because of the continued critical situation in respect to coal and textiles it was decided that the two committees handling these products should continue on an independent international basis. In so continuing their functions in 1946, the committees retained the names "Combined Textile committee" and "Combined Coal committee," under which they had operated when a part of the Combined Production and Resources board.

During the life of the board, members representing the U.S. were Donald M. Nelson and J. A. Krug, successively chairmen of the War Production board; member for the United Kingdom was Oliver Lyttelton, minister of production; and member for Canada was C. D. Howe, minister of munitions and supply. Deputy members were, for the U.S., James S. Knowlson, C. E. Wilson, W. L. Batt and F. M. Eaton; for the U.K., Sir Robert Sinclair and Sir Henry Self; for Canada, E. P. Taylor and G. C. Bateman.

Combined Raw Materials Board.—The Combined Raw Materials board was established on Jan. 26, 1942, to plan and co-ordinate the raw materials programs of the two countries and to collaborate with the other United Nations to secure the most effective utilization of all faw material resources at their disposal.

The activities of the board included analysis of the supply and requirements position of the United Nations for the major critical and essential raw materials; allocation of supplies of scarce raw materials among the United Nations when necessary; and working out agreements to expand supplies, to conserve the use of raw materials in short supply, and to co-ordinate the purchasing activities of the U.S. and Great Britain in foreign raw material markets.

William L. Batt was the U.S. member of this board throughout its entire existence; Sir Clive Ballieu was the U.K. member from Jan. 1942 until Sept. 1943; Sir Charles Hambro from Dec. 1943 to Nov. 1944; and Sir Henry Self, from Dec. 1944 through Dec. 1945. The U.S. secretariat and staff of the board were provided by the War Production board. The U.K. secretariat and staff were drawn from the British Raw Materials Mission, which represented the British Ministry of Supply in Washington, D.C.

The two governments terminated the board on Dec. 31, 1945, and in co-operation with other United Nations established three autonomous Combined Commodity committees with broader international representation, to continue the functions of the board with respect to allocations of tin metal; rubber; and hides, skins and leather.

It was agreed by all of the member governments that the Combined Commodity committees should continue in existence only during the emergency period of global short supply of these commodities. The agreed objectives of the committees were to obtain an equitable distribution of available supplies among the consuming countries of the world, to promote stabilization of the general level of prices; and to obtain the most effective possible use of materials in the postwar reconversion of the economies of the world to the production of peacetime goods and services.

Munitions Assignment Board (Washington).—This board's establishment was also announced Jan. 26, 1942. Working in close collaboration with the corresponding London organization, the board mantained full information of the entire munitions resources of Great Britain and the U.S. and translated such resources into terms of combat forces and their material reserves. The board was responsible for making assignments of stocks and production of finished war material to the U.S. and Great Britain and to others of the United Nations.

Members who served for the U.S. were Harry L. Hopkins, chairman; Adm. J. M. Reeves; Rear Adm. W. R. Purnell; Rear Adm. O. C. Badger; Rear Adm. L. D. McCormick; Rear Adm. V. R. Murphy; Rear Adm. E. W. Burrough; Gen. Brehon Somervell; Lt. Gen. B. M. Giles; Lt. Gen. I. C. Eaker; Maj. Gen. R. C. Moore; Maj. Gen. M. F. Harmon; Maj. Gen. R. L. Maxwell; Maj. Gen. G. E. Stratemyer; Brig. Gen. P. H. Tansey; Maj. Gen. J. H. Burns, executive; Maj. Gen. John Y. York, Jr., executive; Capt. W. S. Gubelmann, secretary; and Col. E. C. Kielkopf, secretary. Members who served for Great Britain were Adm. Sir Charles Little; Adm. Sir Percy Noble; Adm. Sir James Somerville; Vice-Adm. J. W. S. Dorling; Lt. Gen. Sir Colville Wemyss; Lt. Gen. G. N. Macready; Air Marshal D. C. Evill; Air Marshal Sir William L. Welsh; Air Marshal Douglas Colyer; Air Vice-Marshal R. P. Willock; Air Vice-Marshal W. F. MacNeece Foster; Capt. E. M. C. Abel-Smith; Maj. C. M. Berkeley, secretary; and Group Capt. T. E. H. Birley, secretary. The Munitions Assignments board (Washington, D.C.) was abolished after the cessation of hostilities in 1945.

Combined Shipping Adjustment Board.—Creation of the Combined Shipping Adjustment board, constituted by agreement between President Roosevelt and Prime Minister Churchill, was announced on Jan. 26, 1942. The purpose of the board was to "adjust and concert in one harmonious policy" the work of the U.S. and British shipping authorities in regard to shipping problems arising out of World War II.

The board established joint policies for the direction of vessels in the Allied shipping pool during the greater part of the war in order to obtain the maximum over-all economy in the use of available shipping facilities. The board consulted with other combined boards with a view to securing compression of total demands to within the total capacity of shipping, and through its forecasts of shipping availabilities contributed to the determination of shipping priorities and forward planning of military movements.

The Combined Shipping Adjustment board was made up of two boards, located in Washington and London. Admiral Emory S. Land, administrator of the War Shipping administration, and Sir Arthur Salter, head of the British Merchant Shipping mission in the U.S., initially composed the Washington board. Successors to their positions were Captain Granville Conway for the U.S.; John

S. Maclay, W. O. Hart and W. S. Graham for the U.K. Lord Leathers, minister of war transport, and W. Averell Harriman, the president's representative in London in matters of supply and shipping, composed the London board on its inception. Their successors were Alfred Barnes for the British, and Phillip D. Reed and Thomas Blaisdell, successive chiefs of the American Mission for Economic Affairs.

On the termination of the European phase of the world conflict, most of the Allied and neutral tonnage which had been under charter to the U.S. and U.K. was returned to the control of the countries owning the vessels, and the functions of the C.S.A.B., pertaining to programming and allocations, etc., passed over to the United Maritime authority. However, the C.S.A.B. continued in existence to deal with problems of an Anglo-American nature.

Combined Food Board.—Acting jointly, the president of the U.S. and the prime minister of Great Britain on June 9, 1942, authorized the creation of the Combined Food board to obtain a planned and expeditious utilization of the food resources of the United Nations. In Oct. 1943, Canadian Prime Minister MacKenzie King accepted membership on behalf of the government of Canada.

The board was established to investigate and formulate plans with regard to any question relating to supply, production, transportation, disposal, allocation, or distribution, in or to any part of the world, of foods, agricultural materials from which foods are derived and equipment and non-food materials ancillary to the production of such foods and agricultural materials.

Although the board was originally created for the purpose of assisting the United Nations in the conduct of World War II, it was decided after the end of hostilities that in view of the scarcity of many types of food, the board should continue to exercise its functions. Accordingly, it continued to operate until July 1, 1946, at which time it was dissolved by the president of the U.S. and the prime ministers of Great Britain and Canada, and its functions, documents and records were transferred to the International Emergency Food council.

During the life of the board, members who served for the U.S. were Marvin Jones, formerly administrator of the War Food administration and Clinton P. Anderson, secretary of agriculture; for the U.K., R. H. Brand, formerly head of the British Food mission and Maurice I. Hutton, head of the British Food mission; and for Canada, J. G. Gardiner, minister of agriculture. (See also Canadanan-U.S. War Committees.) (S. L. Pr.)

British West Africa

British West Africa consists of four territories, the Gambia, Sierra Leone, the Gold Coast, and Nigeria. Adjoining the two last and administered by them are the mandates of British Togoland and the British Cameroons. All border on the Atlantic and are widely separated from each other by great areas administered by France, and smaller ones under Portugal and Liberia. The Gambia is a narrow strip about the size of Wales lying on each side of the Gambia river; Sierra Leone, about the size of Eire, lies 500 mi. south of the Gambia and is separated from it by territories under France and Portugal; the Gold Coast, about the size of Britain, lies some 1,000 mi. east of Sierra Leone, from which it is separated by Liberia and the French Ivory Coast; Nigeria, about four times the size of Britain, lies east of the Gold Coast and is separated from it by the French mandate of Togoland and the French colony of Dahomey. St. Helena and Ascension islands are

							Area (sq.mi.)	Total Pa 1931 census	opulation Later	Density (per sq.mi.) 1938	Europeans 1936	Chief Towns
Gambia	 					 	4,068	199,520	1938 census 205,000	50.4	217	Bathurst (1931) 14,370
Sierra Leone						 	27,925	1,672,058	1938 census 1,970,000	7 1.3	718	Freetown (1940) 80,000
Gold Coast (incl. Togoland)						 	91.843	3,397,200	1942 census 4.135.304	41.6	2.800	Accra (1937) 72,977
Nigeria (incl. Cameroons) .								20,702,800	1938 estimate 22,334,000	59.9	5,247	Ibadan (1939) 318,300 Lagos (1939) 167,000
St. Helena							47	4,346	1940 census 4,710	37.3	1 <i>57</i>	Jamestown (1931) 1,381
Ascension								188	1940 census 169	5.0	_	<u> </u>

British West Africa

also described under this heading. Certain essential statistics are given in the accompanying table.

All these territories are populated by a tough and vigorous people who developed their own system of agriculture, crafts and internal exchange. Internal exchange is organized through many great markets in which in the southern districts women carry on much of the retail trade. The people live close to the land, and questions of land tenure are of supreme importance. In Nigeria, towns of considerable size are centres for large agricultural districts and seats of government for African rulers. The people are of a great variety of types, and speak a multiplicity of languages which were unwritten until missionaries with African helpers transcribed many of them. In the coastal belt the predominant strain is Negro. In the interior, intermixture with Hamitic people tells of hundreds of years of migration and conquest from the north southwards. In northern Nigeria, Hausa and Fulani people conquered tribal inhabitants and set up great city states under Mohammedan rulers. The tribal peoples vary widely in culture and government; some are citizens of highly organized kingdoms under powerful rulers, others are in small groups of kin. They practise many tribal cults, common features of which are belief in good and evil spirits and ancestors active in the affairs of their descendants. They have a great variety of protective rituals and sacrifices. Tribal cults are tending to disintegrate; Christianity continued to spread during the decade 1937-46, and Islam also gained adherents. Governors: Gambia: Sir Wilfrid T. Southorn (1936-41); Hilary R. R. Blood (after Dec. 24, 1941). Sierra Leone: Sir Henry Monck-Mason Moore (1934-37); Sir Douglas J. Jardine (May 21, 1937-41); Sir Hubert C. Stevenson (after July 5, 1941). Gold Coast: Sir Arnold W. Hodson (1934-41); Sir Alan Burns (after Oct. 1, 1941). Nigeria: Sir Bernard H. Bourdillon (1935-43); Sir Arthur F. Richards (after Dec. 18, 1943). St. Helena: Sir Spencer Davis (1932-37); Henry Guy Pilling (Jan. 1938–41); Major William B. Gray (after March 18, 1941). Ascension: resident magistrate: L. S. Bartlett (1934-36); P. E. Bunker (1937-40); S. H. Cardwell (after 1941).

The decade 1937–46 marked the end of the isolation of these territories from the rest of the world. Rail communications running from coastal points were: Sierra Leone 331 mi., the Gold Coast 500 mi., Nigeria 1,900 mi. There was an extensive development of all-weather motor roads and of secondary roads in both the Gold Coast and Nigeria. Launches and steamers in internal waterways increased the volume and speed of river transport. The development of communications was accelerated by the war. The spectacular development of the period was in air transport. In 1939, one small plane crossed the continent each week from Khartoum to Lagos, and there was no direct air service between West Africa and Britain. During World War II, Accra became the air base for the trans-African air route to theatres of war. After the war there was a trans-African air service, a service of several planes a week from Britain to West Africa and also services to other parts of the continent and to America.

Newspapers had an increasing circulation as literacy

spread. During the years 1939–45 local broadcasting developed, and listening to short-wave broadcasts increased. Men who had served in the forces widened the horizons of villagers by letters and tales. West African journalists visited Britain during the war, and West African units marched in the victory parade in London and had the opportunity to see aspects of town and country life. These men formed their own opinions and passed them on.

With the fall of France, to the danger of invasion by sea was added the danger of invasion by land, from neighbouring French colonies. The declaration of the governor of Chad for Free France, followed by that of the other provinces of French Equatorial Africa, decreased this possibility. Numbers of West Africans volunteered for the services and won distinction in East and North Africa, in Ethiopia and Burma. The precedent was established of sending West Africans to train for commissions at Sandhurst. Funds raised by the people to aid the war were considerable.

Submarines and shortage of supplies in Europe cut down imports, and a movement to live in the country encouraged various local industries. The war increased demand for products of the mines, and in Nigeria, for the first time, mine labour was conscripted. Lack of transportation made shipment of agricultural products difficult, and the government had to buy up the cocoa crop and market it. Some had to be destroyed because of difficulties of transportation. From 1945 on, the government proposed to purchase the crop, fix prices for producers and take responsibility for marketing. The breakdown of isolation promoted an increase of political consciousness, and a determination not to be exploited by the west. The hold-up of the cocoa crop in 1937-38 by producers who refused to sell at prices set by European buyers, strikes and the growth of African trade unions illustrated this point.

Mining development was increasingly important, and the retention in these countries of a reasonable percentage of mining profits was a question brought to the fore in the years immediately preceding World War II. The imposing of income tax in the Gold Coast retained in that country an increased proportion of these profits. The "traders' frontier" was pushed farther and farther into the interior. Both the market for foreign goods and the export of raw materials increased, and this in spite of the fact that production of agricultural produce was almost entirely by African farmers with a primitive economy. The accompanying table shows the importance of this increase:

	(less bullion and cash)	Exports	Total Trade
Gold Coast 1900	£ 1,099,000	£ 864,000	£ 1,963,000
1937	12,306,555	15,949,533	28,256,088
Nigeria 1900	1 <i>,</i> 735,000	1,887,000	3,622,000
1937	14,623,674	19,242,197	33,865,871
Sierra Leone 1900	553,000	318,000	871,000
193 <i>7</i>	1,691,930	2,820,178	4,512,108
Gambia 1900	194,000	241,000	435,000
1937	705,165	665,000	1,370,165

The entering of Africa into the currents of world life marked a new era. Need of survey of the continent had been emphasized in 1929 by General J. C. Smuts, and in 1938 the first survey of the whole continent was published

by Lord Hailey (An African Survey) to be followed by a number of studies, anthropological, political, economic and social, in which West Africa had a goodly share. Government commissions and reports supplemented studies by unofficial bodies.

World War II emphasized the necessity of regional planning and development. Just before its outbreak, a West African governors' conference started. On June 8, 1942, Lord Swinton was appointed minister resident in West Africa with headquarters in the Gold Coast. With the end of the war, this office was terminated and the governors' conference was revived. The enlistment of the services of experts to advise the four territories was under way, the appointment of an income tax commissioner and an authority on town planning being cases in point. It was also recognized that planning which crossed political frontiers was necessary. Control and prevention of disease, soil conservation and communications were some of the spheres in which this was essential. There was increasing consultation with French West and French Equatorial Africa.

The need of developing research led to the setting up of a colonial research committee in Britain. Research was required in many fields, including social anthropology, linguistics, music, arts and crafts, land tenure, tropical agriculture, health and nutrition. Much of this research had to be on an international scale. The setting up of an institute of tropical agriculture for Africa was one relevant proposal.

Colonial Development and Welfare.—A radical change took place in the colonial policy of the British government during the decade in that it no longer expected that colonies should be financially self-sufficient. In 1940, a statement of policy on colonial development and welfare laid down that "the primary aim of colonial policy was to protect and advance the interests of the inhabitants of the colonies" and funds were voted from the British treasury for assistance in development and research. An increased grant was made in 1945 to run to 1956. Advisory and specialist committees were set up to study and approve plans submitted by the colonial governments and to award grants.

Recruitment and training of African and European staffs was essential. In British West Africa, all branches of the civil service, including the administrative, were open to Africans with the necessary qualifications. In the Gold Coast African district, officers were working with European colleagues. Government grants were available to Africans for training, and numbers were being sent to take courses in Britain, including African women as well as men.

The years 1937-46 were marked by progress in supervision of labour. This progress took two main forms: (1) the appointment of special whole-time staffs in the shape of separate labour departments, or of labour and industrial advisers, and (2) the enactment of protective legislation. In 1938, the post of labour adviser to the colonial office was created and a social service department was set up. In 1942, a colonial labour advisory committee was established. Colonial labour departments multiplied from 11 in 1937 to 33 in 1941. Each of the West African colonies had such a department. In 1942 the policy of appointing experienced trade union officials as labour officers was adopted and Sierra Leone, the Gold Coast and Nigeria each had men with this experience. Advice and help was given to the trade union movement in these colonies by these officials. The assistance and advice of the Trade Union congress and of the International Labour office was much appreciated.

It was recognized that true co-operation amounts to economic democracy and that a good co-operative society is a school for good citizens. In the period 1937–46, co-operatives were fostered by the West African governments. In Nigeria, 200 co-operative societies were doing an annual business of £100,000. Thrift and loan societies were increasing. In the Gold Coast, cocoa producers' co-operative societies represented the most important groups of co-operatives.

The British government was committed to the advancement of the colonies to self-government. A condition of this advancement was the growth of sufficient unity among peoples of different origins and cultures to make it possible for them to share in responsibility for the central administration. Progress was made in this direction in the Gold Coast and Nigeria. In the Gold Coast, a new constitution, put into effect in 1946, provided for an elected African majority on the legislative council. In Nigeria, a proposed new constitution provided for representatives of



Natives in Nigeria labouring at the construction of an air base in British West Africa in 1944

the northern and southern provinces in one council, a step towards a united Nigeria. Whether these changes were going far enough was a matter of opinion. Another condition of advance was the evolution of traditional African governments into local authorities in a larger political entity. This depended on the assimilation of political, economic and social conception from without and the evolution of traditional cultures from within. Both in a number of native authorities and in the development of municipal government there were signs of advance.

The history of the years 1937–46 showed that a condition of success for the political, economic and social developments was the spread of education. Christian missions were pioneers in education at all levels, including a university college in Sierra Leone. Christian missions and the African church were responsible for 80% of the educational institutions and were aided by government grants. The declared government policy was that education should not be divorced from religion. A Gold Coast education committee report for 1937–41 referred to the statement in a memorandum of 1925 that "native education must be based on religion" and proceeded: "We state our belief that the essential purpose of education is to open to the citizens of a country a life which is rooted to the unseen

and eternal realities, from which all the potentialities of the child will draw the means of growth. Spirit, mind and body are all alike the concern of education."

The principle had now been accepted that the provision of universal education was a government responsibility, and the governments of these territories drafted ten-year plans for advancement toward this goal. Extension of teacher training in West Africa and the granting of a number of government scholarships for training in Britain were steps being taken to increase the supply of teachers. Though the colonial development and welfare fund gave some assistance, a universal system of education depended on revenue available, and this was determined by economic development.

A commission on higher education in West Africa, which included Africans and Europeans in its membership, reported unanimously in 1945 for the provision of a university of West Africa, though members differed on whether it should be a unitary institution or consist of colleges in Sierra Leone, the Gold Coast and Nigeria. It was also recognized that an educational approach had to be made to the whole population in and out of school and that this was a matter of urgency. A report on mass education in African society went from the colonial office to the colonies which stated the objectives of mass education as: (1) the wide extension of schooling for children within a measurable time; (2) the spread of literacy among adults; (3) the planning of mass education of the community as a movement of the community itself; (4) the effective co-ordination of welfare plans and mass education plans. The Gold Coast appointed a mass education office and local experiments in mass education were in being in Nigeria and Sierra Leone.

The objectives of government for these territories were summed up in the report as follows: to secure (1) the improvement of the health and living conditions of the people; (2) the improvement of their well-being in the economic sphere; (3) the development of political institutions and political power until the day should arrive when the people could become effectively self-governing. It was pointed out that "wise and effective" education was necessary to achieve these ends.

St. Helena and Ascension Islands.—St. Helena, 1,200 mi. W. of the African mainland, and Ascension, 700 mi. to the N.W. of St. Helena, are rugged volcanic islands. St. Helena is a British crown colony. Ascension, until 1922, came under the admiralty; in that year it became a dependency of St. Helena. The population of St. Helena, 157 Europeans excepted, is of mixed race with a strong Malayan strain. The total population by 1941 census was 4,710. Outstanding events in St. Helena for the years 1937-46 were few. Efforts were made to combat malnutrition through instruction, and school meals. The curriculum of the schools was considered in view of the fact that the majority of the people would never leave the island, and that teaching of crafts and agriculture which would raise the standard of life there was important. Efforts were also being made to broaden and enrich the interests of the people. "But," said the education report for 1941, "the conservatism of mind shown by the older St. Helenians is one of the greatest obstacles to progress."

Almost all the inhabitants of Ascension Island in 1939 were officials or employees of the Cable and Telegraph company, which had a station there. In spite of the fact that the island had no running water, fertile farms which produced the only vegetables and milk the island had ever known, were developed 2,000 ft. above the sea. In contrast to the case of St. Helena, Ascension saw great

changes through the war, for the island became one of the landing places for the R.A.F. transport commands ocean ferry across the South Atlantic. Late in 1941, a U.S. reconnaissance party came there, and by March 1942 the main U.S. task force arrived. The engineers moved vast quantities of the lava rock by blasting, and carved the single runway along the track of the prevailing wind, through vast barriers of jagged rock. In June the runway was ready, and the first U.S. aircraft landed on that amazing, but effective strip running between looming crags. Flights to Ascension had to be made by night in order to land at the first light, because the wide-awake birds spend the night in flight, and live on the crags in thousands during the day; when disturbed they are a menace to aircraft. In 1942, 127 aircraft were dispatched by the South Atlantic route via Ascension; in 1943 the number had increased to 1,336. From Ascension the planes were flown about 1,400 mi. to the great air base at Accra and from there on to theatres of war. Ascension Island, before the war an isolated cable station, set in the wide expanse of the Atlantic, became during the war a vital link in the system of air transport, which in the postwar period connected Africa with the rest of the world.

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British West Indies

• See West Indies, British.

British Women's Services, World War II

Women's Royal Naval Service.—Disbanded in 1919, the W.R.N.S. was revived by the admiralty in 1939. Members were at first employed in naval shore establishments in clerical and domestic work and as drivers, but the scope of the W.R.N.S. (or "Wrens") rapidly expanded and developed until at the peak of World War II, when the service numbered 75,000, there were more than 100 categories, some being extremely responsible. W.R.N.S. officers were employed as duty staff officers at operational stations during coastal operations and attacks; they were signal officers and controlled staffs of mixed naval and W.R.N.S. ratings; they boarded merchant ships and issued routing and other instructions to the ships' masters. W.R.N.S. ratings were employed as wireless telegraphists and radio mechanics and worked on the maintenance and repair of naval aircraft and of torpedoes, guns and other equipment; and they manned harbour craft. Both W.R.N.S. officers and ratings were employed on communications in the armed liners used as war transports, being at sea for as long as seven months at a time. The W.R.N.S. continued as a permanent service in the royal navy after the end of World War II. Superintendent J. M. Woollcombe was appointed director in succession to Dame Vera Laughton Mathews on Nov. 22, 1946. (V. L. M.)

Auxiliary Territorial Service.—The A.T.S. was formed on Sept. 9, 1938, on the authority of a royal warrant, as a

peacetime voluntary reserve of women available for employment in noncombatant duties with the British army. Under conditions of service all women between the ages of 181/2 and 43 were eligible for enrolment for a term of four years; in the event of an emergency all members undertook to give full-time service for the duration of the emergency. Members were enrolled and not enlisted; there was therefore no legal method of recalling them to duty. The maximum strength was limited in peacetime to 20,000, and the duties were confined to motor driving, clerical work, storekeeping, cooking and domestic tasks. The organization was built up on that of the territorial army, each A.T.S. company being affiliated to a unit of the territorial army and receiving instructions and supplies from the territorial association of the county in which it was raised.

At the outbreak of World War II the establishment of the service was immediately doubled; all existing units were called up for service and placed under the command of the local army commander, although unit discipline and administration remained in the hands of the A.T.S. officers, as it was to remain throughout the war. Pay was based on two-thirds of the pay of the soldier. In 1941, the size and scope of the service was very greatly increased, the establishment being raised to 210,000, and many new army trades and employments were undertaken by women. The increased importance of the service necessitated considerable changes in the original terms of enrolment and from July 1941 a limited form of the army act was made applicable to the A.T.S. In March 1942, the A.T.S. received the first draft of conscripted women, called up under the National Service (No. 2) act of Dec. 18, 1941; these recruits were subject to the same conditions as volunteers. By 1943, the A.T.S. expansion had reached its peak, a maximum strength of 216,000, with more than 100 different trades and employments being carried out by women. Members were employed overseas in all parts of the world and latterly with the British forces in Europe. The A.T.S. formedan integral part of the British army, and at the end of World War II it was decided to retain women as part of the regular army in peacetime. (M. J. C. T.)

Women's Transport Service.—The W.T.S. trained continuously after its formation in 1907, when it was known as the First Aid Nursing Yeomanry (F.A.N.Y.). In 1938 it supplied all personnel for the formation of the first ten driver companies, A.T.S., and continued to recruit on behalf of the motor companies, A.T.S., until Sept. 1, 1941. All such personnel became fully enrolled members of the A.T.S. The corps continued to exist as a separate organization under the direction of its own headquarters. It ran its own training centre and its members were employed in all theatres of war, in driving, in wireless telegraphy and coding and in welfare services, including southeast Asia command army welfare. Members undertook special missions and were parachuted into axis territory and several died in action or in concentration camps. (M. B. E.)

Women's Auxiliary Air Force.—The W.A.A.F. was formed shortly before World War II and numbered at the end of Aug. 1939 only 1,734 officers and airwomen, who were called up for duty on Aug. 29, 1939. Expansion took place rapidly until by the end of 4 years the service was 106 times its original strength, with officers held in 22 branches and airwomen in 82 different trades. The peak of the service was reached in 1943, and general release began with that of the men in June 1945.

The object of the W.A.A.F. was to effect where desirable

the substitution of women for men in certain branches and trades. With very few exceptions the ratio was one for one. In specified trades it was also necessary to limit substitution to a certain percentage for varying reasons. Personnel were required to reach the same proficiency as the men and attended the same or similar courses. It was early realized that to serve the royal air force successfully the W.A.A.F must form an integral part of it and be employed and administered as far as possible within the framework of the R.A.F. Although constituted by royal warrant, the W.A.A.F. was virtually a civilian organization until on April 5, 1941, under the Defense (Women's Forces) regulations, officers and airwomen were declared to be members of the armed forces and became subject to certain sections of the Air Force act.

During World War II, nearly 250,000 women served with the W.A.A.F. It played its part in every R.A.F. operation and served in overseas commands; it assisted several foreign governments who wished to train their nationals in the United Kingdom, and sent two senior officers to help the Royal Canadian air force to form the R.C.A.F. women's division. In Dec. 1946 Group-officer Felicity Hanbury was appointed director of the service on the retirement of Lady Welsh, who had held that office since Oct. 1943.

(R. E. Wh.)

Air Transport Auxiliary.—The first nine women pilots to enter the A.T.A. started ferrying light trainer types of aircraft on Jan. 1, 1940. During the next 5 years the number of women pilots increased to more than 150, and they flew all types of aircraft, including four-engined bombers, from factories to maintenance units and thence to R.A.F. squadrons; aircraft worn in service were flown back from squadrons to repair units. They worked on an equal footing with the men pilots and received the same pay. In the organization there were also women operations officers, flight engineers, motor transport drivers, ground engineers, nurses and other staff. Two out of the 15 ferry pools were staffed entirely by women. During World War II, 15 women in the A.T.A. lost their lives in flying accidents. All flying activity of the A.T.A. had ceased by Nov. 30, (P. M. G.)

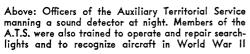
Women's Land Army.—The W.L.A. was organized and in readiness before World War II. In England and Wales, where the organization came formally into being on June 1, 1939, the Land army worked as a section of the ministry of agriculture and fisheries; it had its own headquarters with sub-offices in the different counties. There were also voluntary county committees and very large numbers of local helpers who supervised the welfare of its members. The Scottish Land army came under the department of agriculture for Scotland.

From small beginnings the Land army grew rapidly and reached its peak strength in Aug. 1943, when there were nearly 77,000 girls at work in England and Wales and just under 10,000 in Scotland. At first their employment was mainly in those farm operations for which women are especially suited; e.g., milking and care of young stock.

The field of work gradually extended to cover almost every type of farm job, and at one stage some 30,000 Land army members were employed by war agricultural executive committees in land reclamation, tractor work, drainage operations, threshing and all kinds of field work, while nearly 6,000 were engaged in timber operations and forestry.

At the end of World War II, a release policy was introduced for those girls who wished to return to civilian life, but between 30,000–40,000 remained at work in England, Scotland and Wales. The organization was to be kept up





Upper right: Ward in a Women's Auxiliary Air Force hospital at an R.A.F. depot, where a W.A.A.F. is shown being cared for by an R.A.F. doctor

Right: British women of the Air Transport Auxiliary who ferried planes from aircraft plants to R.A.F. fields during World War II, replacing men pilots needed elsewhere

Lower right: British Wrens (Women's Royal Naval Service) on signal duty









as long as Britain pursued a policy of intensified food production. (I. M. M. J.)

Women's Voluntary Services.—The W.V.S. organization was inaugurated in May 1938 to recruit women for the air raid precautions services and to undertake work for civil defense. The machinery of the W.V.S. centres, with a membership of 1,125,000, followed the pattern of local government administration in Great Britain. Operational work was carried out with A.R.P. and civil defense services, and with municipal authorities covering emergency feeding, staffing of rest centres, report centres and incident inquiry points, billeting, rehoming, issue of clothing, etc. Much of the billeting and care of evacuees and refugees was carried out by W.V.S. Special work was done in evacuating children under five years old, and in war and day nurseries. Over 51,000 children under 5 were handled from W.V.S. headquarters alone. A volunteer car pool to provide cars in case of invasion, air raids and other emergencies, numbered 20,000 drivers, and a mileage of 60,000,000 mi. in 3 years. This developed into a peacetime hospital car service. Work parties dealt with emergency appeals for civilian and service requirement and for aid to liberated countries. The services welfare program included clubs, canteens, hostels, guides and hospitality schemes for members of the British and Allied forces; over 1,000 W.V.S. members worked in clubs overseas. National savings, conservation and preservation of food and textiles, the collection of books and salvage schemes were attended to by street and village units. As sole agents for the American Red Cross, the W.V.S. handled over £10,000,000 worth of supplies, in addition to gifts from organizations in the British empire, the United States and other countries. Children from liberated countries, repatriated families from the far east and others, were clothed and their welfare was looked after. There were W.V.S. counterparts in India and throughout the British empire. Close contact and interchange of information were fostered with organizations modelled on the W.V.S., in Holland, Denmark, France, the United States, the dominions and other countries.

In 1946, the W.V.S. continued to meet the requests of government departments or local authorities for the betterment of the community, through communal feeding, food advice, clothing exchanges, mothercraft hostels, rehabilitation and resettlement work and home helps, and by supplying special schemes for the care of children, old people and specific cases. (See also Canadian Women's Services, World War II.) (Rg.)

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Broadcasting

See RADIO; TELEVISION.

Bromine

The use of bromine in the production of tetraethyl lead for gasoline treatment was responsible for a 20-fold increase in bromine output of the U.S. in the decade before 1937, after which production was as follows, in short tons.

193713,100	194029,633	194347,043
1938 16,662	194134,159	194451,056
193918,941	194232,940	194539,855

Increases after 1942 resulted from the increased gasoline consumption in military transport vehicles and in aeroplanes.

Formerly secured as a by-product from well brines produced for the recovery of salt and magnesium chloride, the bulk of the output later came from sea water, which contains only a small fraction of 1% of the element. Other sources are sea water bitterns, dry-lake salt deposit at Searles lake, Calif., and the water of the Dead sea.

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Bronx-Whitestone Bridge

See BRIDGES.

Brooke, Sir Alan Francis

See Alanbrooke, 1st Viscount (Alan Francis Brooke).

Brooke, Sir Basil Stanlake

Sir Basil Brooke (1888-), British statesman, was born June 9, 1888, the heir to a baronetcy established in 1822, and a nephew of Field Marshal Alan Brooke. He was educated at Winchester and Sandhurst, entered the army and served throughout World War I, receiving the Military Cross. He was elected to the Northern Ireland parliament in 1929, became minister of agriculture and privy councillor in 1933, and succeeded John M. Andrews as prime minister of Northern Ireland on May 1, 1943. Well-known for his hostility to Irish Catholics, he announced soon after his appointment that Northern Ireland planned a program of closer co-operation with Great Britain in the war effort. In Jan. 1944 Sir Basil said Northern Ireland also would support an agreement with the U.S. and Great Britain for regulating postwar civil aviation, in the hope of increasing its commerce with the U.S. On the topic of Eire's demand for return of the Ulster counties, he stated (Nov. 15, 1945) that Northern Ireland was "uncompromisingly opposed" to its inclusion in an all-Ireland republic.

Brooke-Popham, Sir Robert

Sir Robert Brooke-Popham (1878–), British air force officer, was born Sept. 18, 1878, in Mendelsham, Suffolk. He was educated at Haileybury and Sandhurst, entering the army in 1898. In 1912 he helped establish the air battalion of the royal engineers, a "freak unit" that was the forerunner of the royal air force. During World War I, Sir Robert was one of the first British pilots to fly over the German lines and was frequently cited for bravery. After that war, he headed a number of important air commands, becoming air chief marshal in 1935 and inspector general of the R.A.F., 1935-36. He retired in 1937 to become governor general of Kenya, but returned to the R.A.F. as air chief marshal at the start of World War II. He was appointed commander in chief of British forces in the far east in Nov. 1940, but was removed from his command, Dec. 27, 1941, after the disastrous rout of British imperial troops in Malaya by the Japanese. He returned to retirement in 1942.

Brookings Institution

See Societies and Associations.

Broomcorn

The acreage and production of broomcorn was extremely variable for many years. The 1935 crop in the

DROWN A DROSSES

U.S. amounted to 61,800 tons, while that of 1939 was only 30,000 tons. Then followed an increase to the largest in 20 years in 1944–67,200 tons—followed in 1945 with only 31,700 tons.

11.5.	Production of	Broomcorn F		Leading	States	7	037-	46
U.J.	Froud Chon on	DI GOIIICOI II L	Jy	rengina	Jiules,		73/-	+0

			(in tons)				
	1937	1939	1941	1943	1944	1945	1946*
U.S. Total	45,500	30,000	46,300	36,200	67,200	39,200	43,900
Colorado	2,100	3,800	9,000	13,900	17,700	15,600	13,500
Oklahoma	18,000	8,800	10,200	9,400	20,400	11,600	16,100
Illinois	13,400	7,500	7,800	3,200	3,900	2,000	3,300
Texas	4,600	2,200	4,200	2,700	8,500	5,500	5,900
Kansas	1,400	1,500	3,100	2,200	4,400	1,800	1,800
New Mexico .	6,000	6,500	12,000	4,800	12,300	2,700	3,300
*Preliminary es	timate						

The widely variable price was the chief cause of this irregularity in production. Prices ranged from \$70.14 per ton to growers in 1937 to \$268.12 per ton in 1943. The latter high price led growers to expand acreage over 56%, which, with an increase of 19% in the yield, brought the unusual crop of 1944. Labour shortage was the restricting factor in 1945, together with an unfavourable planting season. The acreage harvested dropped to 36% below that of 1944 and 14% below the average.

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(J. C. Ms.)

Brown, Prentiss Marsh

Brown (1889—), U.S. attorney and government official, was born June 18, 1889, at St. Ignace, Mich. He received his A.B. degree at Albion college, Albion, Mich. (1911), and studied at the University of Illinois (1911–12). Admitted to the Michigan bar in 1914, Brown later became active in law, business and politics. He ran unsuccessfully as Democratic candidate for congress in 1924 and for the Michigan supreme court in 1928. Brown was elected to the house of representatives, however, in 1933, and in 1936 was appointed to the senate to fill the vacancy caused by the death of Sen. James Couzens. He was elected to the senate for the 1937–43 term.

While in the senate, Brown sponsored the important price control act of April 1942, and the price stabilization act of Oct. 1942. Upon his defeat for re-election, he accepted Pres. Roosevelt's invitation to succeed Leon Henderson as price administrator in Jan. 1943. Illness prevented him from actively guiding the OPA, however, and he resigned on Oct. 21, 1943.

Brownell, Herbert, Jr.

), U.S. politician, was born Feb. Brownell (1904-20, 1904, at Peru, Neb., the son of a science professor. Graduated from the school of law, Yale university (1927) with an LL.B. degree, he practised law in New York city, joined the Republican party and soon became active in politics. He was elected to the New York state assembly from the 10th district in 1932, serving in the assembly from 1933 to 1937. He left politics after completing his term as assemblyman, but returned to the "fray" in 1941, this time not as a candidate but as a manager. In 1942 he returned the favour to Thomas E. Dewey, who had helped elect him assemblyman, and became Dewey's campaign manager for governor in the 1942 elections. Dewey's election was in no small part attributed to Brownell's organization, which was conceded even by the opposition to have been excellently managed. In 1944, Dewey made him not only his presidential campaign manager but chairman of the Republican National committee as well. That Dewey lost to Roosevelt was ascribed by Brownell to the fact that no candidate had a chance to unseat the president with the war still in progress. He was retained as chairman in 1945, but on Feb. 24, 1946, announced his intention to resign. He was succeeded by B. Carroll Reece.

Brozovich or Broz, Josip

See Tito.

Brunei

See Borneo.

Bruno, Giuseppe

Cardinal Bruno (1876—), Italian prelate, was born at Lezzadio, province of Alessandria, Italy. Upon completing his theological and juridical studies in Rome, he was ordained in 1898. Appointed to the Commission for Codification of Canon Law, he served under Cardinal Enrico Gasparri. Msgr. Bruno was, in 1945, a member of the Commission for the Interpretation of the Code and had been a member of the congregation of the Council for 30 years. Nominated to the Sacred College of Cardinals on Dec. 23, 1945, he was the only one of the nominees of that year whose duties kept him in Rome regularly. The body of which he was secretary supervises church law and makes arrangements for councils and conferences of bishops. He was created cardinal on Feb. 18, 1946.

Brussels

At the beginning of the decade 1937-46, Brussels led a happy life as capital of a small but prosperous nation. The year 1938, however, reminded the people of political and geographical realities; they remembered 1914 and had no illusions about the future. On May 17, 1940, motorized German columns entered the Belgian capital. On June 2 Gen. Alexander Ernst von Falkenhausen took up residence in Brussels as German governor-general of Belgium and northern France, and also Gen. Eggert Reeder, as chief of the German military administration for Belgium. The latter soon came to the conclusion that the agglomeration of 19 separate communes usually referred to as greater Brussels would be more easily controlled by a single body of collaborators than by 19 patriotic burgomasters and their councils of aldermen (échevins). He suggested the creation of greater Brussels. This reform was at once opposed by the municipal councils as illegal; the argument was that Germany had no right to change the laws of Belgium. In order to crush this opposition Reeder ordered on April 11, 1941, the dissolution of all municipal councils. But opposition was voiced by the burgomasters, headed by Dr. Joseph van de Meulebroeck, burgomaster of the city proper. Reeder decided to dismiss this fierce successor and pupil of Adolphe de Max, burgomaster during World War I. On the day of his dismissal (June 30, 1941) Dr. van de Meulebroeck declared that he still was and should remain "the only legitimate burgomaster of Brussels." On Sept. 27, 1942, General Reeder and G. Romsée finally created greater Brussels with Jean Grauls, a Flemish nationalist, as burgomaster. According to an official estimate of Dec. 31, 1939, the total population of the arrondissement was 1,277,847, of the 19 communes 943,658 and of the city of Brussels 189,036. The city proper covered 12.7 sq.mi.

Brussels was liberated on Sept. 3, 1944, by the British and army. Five days later the legitimate Belgian government returned to its capital from London. One of its first acts was to annul all the German-promulgated legislation. The greater Brussels automatically ceased to exist. Dr. van de Meulebroeck was back in his hôtel de ville. (K. Sm.)

Bubonic Plague

See PLAGLE, BLBONIC AND PNEUMONIC.

Bucharest

Bucharest, capital of Rumania, lies in a valley of the Dimbovita river; it covers an area of some 20 sq.mi. and had an estimated population of 648,162 at the end of the decade (631,228 by the census of 1930).

The intrigue that characterized Rumanian politics for decades prior to 1940 had its source in the capital, Bucharest, whence it seeped through all classes of society. Both major political parties had maintained their sway by means of corrupt elections and coercive decrees. When in power they had censored the press and abolished several popular newspapers for too-frank editorials. They decreed anti-communist and anti-socialist laws, although these parties had never polled more than 2% of the votes. Labour, too, fared badly.

Cabinet succeeded cabinet, revolt led to revolt in the continual battle for personal power; and the country was ripe for the dictator's squeeze.

During World War II, Rumania was not devastated like many other European countries, although it became Germany's partner in defeat. Russian-incited riots and antifascist demonstrations flared in Bucharest, fed by workers and children who were forced to attend. After the Rumanian surrender to the Allies on Aug. 23, 1944 (in retaliation for which the Germans bombed Bucharest rather severely) the capital as well as the country became virtually a Russian province, taking orders from Russian Commissar of Foreign Affairs Andrei Vishinsky. Millions of dollars worth of reparations were siphoned into the soviet union. (See also Rumania.)

Buckner, Simon Bolivar, Jr.

Buckner (1886–1945), U.S. army officer, was born July 18, 1886, near Munfordville, Ky., son of the celebrated Confederate general, Simon Bolivar Buckner, who fought U.S. Grant at Fort Donelson and served under Braxton Bragg in the Chickamauga campaign. The younger Buckner also decided on a military career. After studying at the Virginia Military institute, he entered the U.S. military academy at West Point, graduating in 1908. He subsequently returned to West Point and was instructor there of military tactics (1919–23) and commandant of cadets (1932–36). During World War I, he commanded aviation training brigades.

In July 1940, more than a year before the U.S. entry into World War II, Gen. Buckner was made commander of the Alaska defense force. He played a prominent role in the recapture of the Aleutians from the Japanese in 1942–43. Awarded the D.S.M. in Oct. 1943, he was raised to the temporary rank of a lieutenant general. After the Aleutians campaign, he reported to the Central Pacific command and was named commander of the new U.S. 10th army. On April 1, 1945, this force invaded Okinawa. Three days before the end of the Okinawan campaign, Buckner was fatally wounded by an enemy artillery shell, June 18, 1945, while watching his troops in action from a forward observation post.

Buckwheat

For 50 years prior to World War I, U.S. buckwheat acreage was fairly stable, at about 800,000 ac. The crop varied with the seasons from 7,000,000 to 14,000,000 bu.

In 1918 a 1,000,000 ac. crop was grown, producing 14,404,000 bu. Following World War I the crop declined in favour and averaged less than 600,000 ac.; by 1937 the average crop for the decade was only about 6,500,000 bu.

World War II had only small effect on production until 1944, when 9,166,000 bu., the largest crop in 16 years, was harvested. This was grown on 575,000 ac. with a yield of 17.8 bu. per acre which was above the average. The season was favourable for the crop, and yields were high in the principal buckwheat states, Pennsylvania and New York. The crop of 1945 dropped back to the average, although the acreage remained above average, and that of 1946 was smaller. About two-thirds of the acreage and production continued to be in Pennsylvania and New York, with Michigan and Minnesota contending for second place.

u.s.	Buckwheat	Production	Ьу	Leading	States,	1937-46
		Un thousan	de i	of husbal	e)	

	1937	1939	1941	1942	1943	1944	1945	1946*
U.S. Total	6,764	5,669	6,038	6,636	8,830	9,166	6,644	7,105
Pennsylvania.	2,275	1,808	2,240	2,145	2,508	2,940	2,016	2,394
New York .	2,448	2,077	2,014	2,257	3,274	2,700	1,519	2,147
Minnesota .	158	188	253	420	442	945	630	588
Michigan	202	247	232	391	800	512	350	243
Ohio	248	192	158	216	294	294	306	340
Wisconsin	150	162	218	210	442	418	294	266
Tennessee .	27	21	30	29	60	72	144	165
West Virginia	298	248	234	209	209	185	172	133
Indiana	143	98	62	91	196	150	270	90
Maine	165	117	105	119	140	120	93	120
Virginia	189	182	144	128	98	132	102	105
Maryland	98	100	100	98	105	120	141	118
Illinois	42	16	30	78	140	82	225	80
North Dakota	66	11	42	63	42	64	112	78
*Preliminary est	imate.							

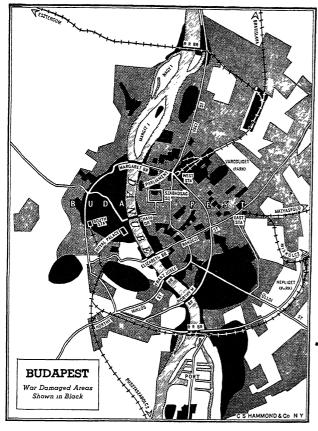
Over half of the buckwheat crop was used as livestock feed and about one-fourth was ground into flour for human consumption. The old-fashioned buckwheat cake did not gain in popularity during the decade 1937–46, and most of the flour was used in pancake mixtures. Prices of buckwheat to growers averaged about 60 cents per bushel in the prewar period but increased to \$1.48 in 1945, and to \$1.67 in August 1946. Very little of the U.S. grain entered foreign trade. Canada grew about 4,000,000 bu. annually, most of it in the eastern provinces of Ontario and Quebec.

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Budapest

Budapest, capital of Hungary, had a population of 1,115,877 by the 1939 census.

Although Hungary declared war on the Allies in 1941, the country was not invaded until late in World War II. In Nov. 1944, Russian troops closed in on Budapest and by Dec. 26 had ringed the city. The German garrison thus trapped fought savagely during a 50-day siege that ended on Feb. 13, 1945. During the fighting for the city the defenders emptied department stores, the university, commercial and government buildings and filled them with war supplies, connecting the buildings by underground passages. The city thus became a fortress. All seven bridges across the Danube connecting Pest with Buda were blown up by the defenders, and barricades were formed by dumping pianos and similar objects out of warehouse windows into the streets. Russian troops shelled the city from Andrassy, four miles away, gradually closing in and finally driving the Germans out of Pest into Buda on Dec. 30. From Pest the invaders fired into Buda, while bombers added to the wreckage of the city, and hand-tohand encounters were fought from building to building, block by city block, in battles that favoured first one side and then the other. Although the Hungarian govern-



ment signed an armistice with the U.S.S.R. on Jan. 20, 1945, and declared war on Germany, fighting continued in Buda between small pockets of isolated nazis and the Russians, the Germans still maintaining control of many buildings. Finally, out of ammunition, in a wrecked city, resistance ended. More than 159,000 German and Hungarian troops were killed or captured in fighting for control of Budapest, the largest axis loss in personnel after the battle of Stalingrad.

Budenny, Simeon Mikhailevich

Budenny (1876—), soviet army officer, was born April 25, 1876, at Koziurin, in the Don Basin. The son of a Cossack farmer, he entered the imperial army in 1903. After the start of the Russian revolution in 1917, he was elected president of the divisional soviet of Caucasian troops. Although not a communist, he soon found himself attacked by the "Whites." With a force consisting of only a few friends and relatives, he started guerrilla warfare against the "Whites." His forces increased and by 1918, he joined the Red army and a year later the Communist party. He became commander of the first Red cavalry army and took an active role in the fighting against Wrangel and in the Polish campaign (1920). Later, he was made chief of the Red cavalry.

Entering the Moscow military academy, he was graduated in 1932 and was made a marshal of the soviet union in 1935. He took a leading role in the Russo-Finnish War, 1939-40 and was made first vice commissar for defense in Aug. 1940. In July 1941, after the Germans invaded the soviet union, Budenny was made commander in chief of soviet armies defending the Ukraine. In compliance with Joseph Stalin's "scorched earth" policy, he ordered the blasting of the Dnieper river dam in Aug. 1941. He was shifted from the southern front, Oct. 23, 1941, and was charged with formation of new soviet armies. Budenny re-

ceived the Order of Lenin in 1943 and 1945 and the Order of Suvorov in 1944.

Budgets, National

A national budget sets forth the expenditures and receipts of the government and a balanced statement showing the condition of the government's finances at the end of each period. In the United States, the Budget and Accounting act of 1921 provided for a national budget system and created a bureau of the budget to prepare for the president the budget of the U.S. government. The act directed the president to submit to congress on the first day of each regular session a budget presenting the expenditures and receipts of the federal government for the fiscal year just completed, estimated expenditures and receipts for the current and ensuing fiscal years and balanced statements showing the condition of the treasury at the end of each of these periods. The act provided that the budget document should also include discussion of the financial condition of the government and recommendations on the many aspects of government fiscal policy.

Instrument of Government Policy.—During 1937–46, the U.S. budget underwent substantial change. At first, the requirements of economic recovery and, later, the requirements of total war transformed the budget into the major expression of government economic policy.

In the early years of its conception, the budget had been utilized primarily as a mechanism for determining the prospective balance between estimated revenues and contemplated expenditures of the government. Although a few economists and others recognized that government fiscal policy had an influence upon general economic conditions, such considerations did not enter into the practical task of budget making. The purpose of budgeting by the government was merely to assist in allocating revenues to the more important functions of government and, in the process, to reveal possible economies in government operations. Whatever control over the level of economic activity that might be necessary was considered to be a function of the Central Bank system, to be effected by the customary tools of monetary policy.

This conception of the role of budget making was not challenged in the early days of the New Deal administration. In fact, the Roosevelt administration at first tried to apply the conventional ideas of sound government finance even more drastically. One of its first official actions was a sharp curtailment of many types of government expenditures in an effort to make good on its campaign pledge to balance the budget. However, as it became apparent that this policy was not bringing economic recovery, the administration abandoned orthodox fiscal ideas and embarked upon the policy of using government expenditures to provide re-employment. From 1934 until the end of the decade 1937-46, the government's budget provided substantial sums for such programs as work projects, power facilities, public highways, schools, recreation facilities, public buildings and others designed to provide jobs and to raise the level of the national income.

The budgets of the Roosevelt administration also differed from their predecessors in providing for the new social programs assumed by the federal government during these years. To some extent the federal government undertook functions which were formerly restricted to state and local governments, but other functions were undertaken that were entirely new government responsibilities. Pro-

vision for relief, social security, railroad retirement, slum clearance, aids to youth, reforestation and agricultural rehabilitation came to be familiar items in the federal government's budget. Thus, from programs that embraced the objectives of both recovery and reform, government expenditures were substantially increased in the latter half of the 1930s. While government revenues were increased by means of new and higher taxes, substantial deficits were a characteristic feature of the budget during this period.

The changes which occurred can be highlighted by contrasting the budget of a pre-New Deal year like 1931 with that of a year like 1939, when the New Deal program was fully formulated.

Federal government expenditures in 1931 totalled approximately \$4,092,000,000, whereas in 1939 the total was \$8,765,000,000. In part this rise was caused by increased outlays for functions and expenses existing in 1931, such as national defense, the legislative, judicial and civil establishments, public highways, improvement of rivers and harbours, flood control, interest on the public debt, etc. In the main, however, it resulted from the new activities of the federal government, such as the Agricultural Adjustment program, \$782,000,000; social security, \$347,000,000; railroad retirement, \$110,000,000; Tennessee Valley authority, \$41,000,000; grants to public bodies for public works, \$379,000,000; direct relief, \$104,000,000; work relief (WPA, etc.), \$2,283,000,000 and the Civilian Conservation corps, \$290,000,000. Expenditures for these items in the fiscal year 1939 totalled \$4,336,000,000.

Concurrently with this rise in expenditures there was an increase in government revenues derived from various new taxes, higher rates on existing taxes and increased receipts flowing from the general expansion of economic activity. By 1939, total revenues had expanded to \$5,667,824,000, in contrast to the 1931 total of \$3,189,639,000. A substantial increase in government revenues came in the area of direct taxes on individuals, where the 1931 receipts of \$882,000,000 rose to \$1,390,000,000 by 1939. Direct taxes on corporations increased from \$1,026,400,000 to \$1,277,000,000 over the same period while the receipts from excise taxes advanced from \$521,300,000 to \$1,755,000,000. Employment taxes, levied to finance the social security program, yielded \$740,000,000 in 1939 whereas in 1931 such taxes were not a part of the federal revenue structure.

With government expenditures rising much more than revenues, the budget operated at a substantial deficit during all of the second half of the 1930s. Where there had been a budget deficit before the Roosevelt administration came to office, it was caused by the falling away of government revenues during the depression. In 1931, for example, the deficit was \$902,000,000. The New Deal deficits, however, were in a sense planned deficits, designed to contribute to general economic recovery. In 1939, to take a year fairly typical of the period, the excess of government expenditures over receipts amounted to \$3,600,000,000.

Thus, it may be seen that during these years, the budget was transformed from a financial accounting statement into the primary instrument of the administration's economic program. It was perhaps because of this change in emphasis that the bureau of the budget was transferred from the treasury department to the executive office of the president in 1939.

Effects of World War II.—The outbreak of war in Europe initiated a new period in U.S. budgetary history, a period that was to see the budget expanded to a point where it dominated the entire economy. Even during the

first year of the war, when the scale of the conflict was not yet apparent, an increase in national defense expenditures was undertaken. Such expenditures amounted to \$1,711,000,000 in the fiscal year of 1940 as compared with \$1,251,000,000 in the previous year.

With the fall of France and the Low Countries in May 1940, the scale of the government's rearmament program was considerably increased. In June of that year, the president set the size of the program at \$5,000,000,000, but this figure was continuously revised upward as the vast plan of nazi aggression was revealed in the battle of Britain and the attack on the U.S.S.R. Through the leadership of President Roosevelt, the nation became determined not only to create strong national defense forces, but also, by means of the lend-lease program, to become the "arsenal of democracy." Both the scale and the tempo of the rearmament effort could be seen in the budget expenditures for national defense. These reached a figure of \$6,301,000,000 in the fiscal year of 1941 and rose to \$26,011,000,000 in the fiscal year of 1942.

It was not until the actual entrance of the United States into the world conflict in Dec. 1941 that the full impact of the war upon the budget was revealed. The first war budget of the president, submitted to congress approximately a month after Pearl Harbor, demonstrated to the nation and the world what was to be the answer to that act of aggression. From the outset, it was clear that the government intended to mobilize the nation for total war and that the full weight of U.S. economic strength was to be used in a fight to the finish with the axis powers. While the president's war program of 60,000 planes a year and 6,000,000 tons of merchant shipping was to be proved conservative by later accomplishments, the request in his first war budget for war expenditures of \$53,000,000,000 set the pattern for the all out character of the U.S.'s war effort that was to be followed during the entire period of the

In its actual results, war production (q.v.) far surpassed the goals set by the president. National defense expenditures in the fiscal year of 1943 reached \$72,109,000,000 while in the peak year of the war effort they rose to \$90,029,000,000. In terms of munitions production, the president's goals were more than doubled by the output of planes, tanks and ships, which the U.S. economy produced.

In the area of non-war government expenditures, the goal of curtailment to a minimum basis was set in the early stages of the war. Because of various pressures and the time required for bringing programs to a close, this objective was not achieved immediately. By 1945, however, the nonwar functions of government were virtually on a minimum basis. In some of the areas of government expenditures, this did not show up in the budget figures owing to the fact that rising prices and wages, a consequence of wartime inflation, tended to maintain the level of expenditures. It may be seen, however, that aids to agriculture had declined to \$602,000,000 in fiscal 1945, compared with \$1,042,-000,000 in 1939, and that expenditures for the general public works program dropped from \$518,000,000 to \$291,-000,000 during the same period. Furthermore, expenditures for such government functions as work relief, direct relief and aids to youth, which had amounted to \$2,982,-000,000 in 1939, were virtually eliminated from the budget by 1945.

On the other hand, it was apparent that a few categories of budget expenditures would be substantially increased for many years to come as a consequence of World War II. By 1945, expenditures on aids to veterans had expanded to \$2,044,000,000 in contrast to the prewar level of little more

Table I.—General Budget Summary—United States (For fiscal years. In millions)

	(1011)	scui yeuis		112)				E-17
Description	1937	1939	1941	1942	1943	1945	1946	Estimated 1947
General and Special Accounts								
Receipts Direct taxes on individuals Direct taxes on corporations Excise taxes Employment taxes Customs Miscellaneous receipts Adjustment to daily treasury statement basis	\$1,397 1,220 1,752 266 486 217 —44	\$1,390 1,277 1,755 740 319 187	\$1,824 2,211 2,390 932 392 509	\$3,696 5,021 3,128 1,194 389 277 -37	\$6,953 9,916 3,777 1,508 324 907	\$19,789 16,399 5,935 1,793 355 3,469	\$19,008 12,906 6,696 1,714 435 3,480	\$18,367 9,762 7,062 1,881 463 3,384
Total receipts	5,294	5,668	8,268	13,668	23,385	47,740	44,239	40,919
Deduction: Net appropriation to federal old-age and survivors' insurance trust fund Net receipts	265 5,029	503 5,165	661 7,607	869 12,799	1,103	1,283	1,201	1,329 39,590
Expanditures								
Expenditures: National defense Interest on public debt Refunds Veterans' pensions and benefits International finance Aids to agriculture	967 866 56 1,129 — 760	1,251 940 68 551 1,042	6,301 1,111 90 559 —	26,011 1,260 94 552 1,092	72,109 1,808 79 600 — 1,037	90,029 3,617 1,715 2,044 — 602	48,542 4,722 3,034 4,226 833 802	18,978 5,000 1,857 6,205 3,093 1,346
Social security, relief, and retirement: Social security program	199	347	444	496	498	476	539	669
Work relief	2,191 12	2,612	1,438	937	317	- 5 -	4	12
Retirement funds Aids to youth Housing, excluding defense housing General public works program	47 452 18 338	182 368 19 518	217 347 17 618	244 251 17 649	322 18 15 522	506 12 291	539 40 377	571 361 787
General government: Legislative branch The judiciary Executive office of the president Civil departments and agencies Post office department (general fund) District of Columbia (federal contribution) Pay increase not absorbed above (anticipated	24 -3 1,071 39 5	22 9 2 729 40 5	24 , 11 3 748 30 6	27 12 2 728 18 6	27 12 3 797 9 6	29 13 2 1,058 — 6	23 15 3 1,145 169 6	37 17 5 1,683 241 8
supplemental appropriation) Statutory public debt retirement	104	 58	64	95	3	_	_	160
Total expenditures	8,281	8,765	12,774	32,491	78,182	100,405	65,019	41,030
Excess of expenditures over receipts	3,253	3,600	5,167	19,692	55,900	53,948	21,981	1,440
Effect of Operations on the Public Debt								
Public debt at beginning of year	33,779	37,165	42,968	48,961	72,422	201,003	258,682	269,422
Increase in public debt during year: General and special accounts: Excess of expenditures over receipts Checking account of wholly owned government corporations and credit agencies:	3,252	3,600	5,165	19,692	55,901	53,948	21,981	1,440
Net expenditure, excluding redemption of obligations in the market Redemption of obligations in the market . Trust accounts:	-371 -	320 -1,106	1,054 -852	1,894 1,809	1,523 694	ーフ 1,553	-1,305 95	509 80
Excess of expenditures over receipts Statutory public debt retirement	96 104	-98 -58	-54 -64	-197 -95	-356 -3	-2,344 -	429	399
Retirement of national bank notes Change in treasury balance	-99 -128	-5 622	742	358	6,515	4,529	-10,460	-10,850
Increase in public debt during year	2,646	3,275	5,993	23,461	64,274	57,679	10,740	-8,422
Public debt at end of year	36,425	40,440	48,961	72,422	136,696	258,682	269,422	261,000

Table II.—U.S. Government's Budget and the Nation's Budget

Calendar years 1939 and 1944

(Current prices*, in millions)

	Caler	idar year 19	939	Calendar year 1944			
Economic Group	Receipts	Expendi- tures	Excess (十), deficit (一)	Receipts	Expendi- tures	Excess $(+)$, deficit $(-)$	
Consumers Income after taxes	\$67,300	\$61,700	+\$5,600	\$132,800	\$97,000	+\$35,800	
Business Undistributed profits & reserves Gross capital formation Excess of receipts (+) or capital formation (-)	8,300	10,900	-2,600	12,300	2,600	+9,700	
State & local government Receipts from the public, other than borrowing Payments to the public Excess of receipts (+) or payments (-)	8,900	9,100	-200	10,400	8,800	+1,600	
Federal government Receipts from the public, other than borrowing Payments to the public Excess of receipts (+) or payments (-)	6,500	9,300	-2,800	47,900	95,000	<i>-47,</i> 100	
Less: Adjustments†	2,400	2,400		5,900	5,900		
Total: Gross national product Receipts	88,600	88,600	0	197,500	197,500	0	

*Prices in 1944 were between 25% and 30% above 1939. †Mainly government expenditures for other than goods and services.

than \$500,000,000. Payments of interest on the public debt also rose substantially with the increase in the debt outstanding. Interest payments in 1945 totalled \$3,617,000,000 compared to \$940,000,000 in

From the very start of the expansion of the U.S. national defense program, congress enacted legislation to increase government revenues and in every year from 1940 to 1943 new tax legislation was passed. Income taxes on individuals were raised to the highest level of the nation's history, and excise taxes on commodities and services were substantially increased while the list of goods subject to tax was very much enlarged. The corporate income tax was soon raised to 40% of taxable income and an excess profits tax with a very high rate schedule was imposed on corporate earnings. The general goal set for government revenues was approximately 50% of expenditures. While the government desired a high level of revenues to hold down the amount of the budget deficit and to act as a brake upon the inflationary impact of the huge volume of government expenditures, the fiscal instrument was not the primary means utilized to combat wartime inflation. The main reliance of the government was placed, rather, upon administrative control of prices, rationing of goods to consumers, allocation and priorities of materials, supplies and equipment and renegotiation of war contracts as experience demonstrated that lower prices were feasible.

Nonetheless, government revenues were very materially increased. At the peak of the war effort in 1945, receipts of the government totalled \$47,740,000,000, compared with \$5,668,000,000 in 1939. By far the largest part of the increase came from direct

taxes on individuals and corporations. By 1945, direct taxes on individuals, largely accounted for by the individual income tax, yielded \$19,789,000,000 while the corporate income and excess profits taxes produced \$16,-399,000,000 in government revenues. In 1939 taxes on individuals had amounted to \$1,390,000,000, and the corporation income tax had yielded \$1,277,000,000. With respect to excise taxes, the volume of goods upon which taxes could be levied actually decreased in the course of the war as production facilities were converted to the munitions program. The high rates of tax imposed, however, and the extension of the list of commodities subject to tax, produced a substantial increase in excise tax yields. The 1939 receipts of \$1,755,000,000 rose to \$5,935,000,000 in 1945. It may be noted in Table I on the preceding page that there was a very large rise in miscellaneous receipts as the war progressed. This was accounted for in large measure by receipts from the renegotiation of war contracts.

As government expenditures increased far more than revenues during the war, there occurred a tremendous increase in the annual budgetary deficit. The annual deficit reached levels which dwarfed prewar figures, while the total public debt increased to magnitudes never before contemplated. The excess of expenditures over receipts reached its peak in 1943 with a total of \$55,900,000,000 as against \$3,600,000,000 in 1939. Although war expenditures rose substantially from 1943 to the peak year of 1945, the operating deficit actually declined because of the doubling of tax revenues that followed the tax bill that was enacted late in 1942. Even in fiscal 1945, however, the operating deficit of \$53,948,000,000 was only \$2,000,000,000 less than the peak of 1943. The magnitude of the accumulated deficits of the war years could be seen in the increase of the public debt, which rose from \$40,440,000,000 in 1939 to \$258,682,000,000 at the end of the fiscal year of 1945.

Reconversion.—As soon as the war in Europe was concluded, the government began the curtailment of its war production program. The fact that huge stocks of war matériel had been built up in preceding years made it possible to slow down the rate of current output, even though victory had not yet been achieved in the Pacific. When that victory was won in the late summer of 1945, the immediate liquidation of the war production program was undertaken. The effect of these actions was already dramatically apparent in the budget expenditures for national defense in the fiscal year 1946, when outlays for this purpose dropped almost half to a figure of \$48,542,-000,000. The liquidation was so rapid it was expected that by 1947 national defense expenditures would be down to \$18,978,000,000. While this total was only a fifth of the wartime peak of defense expenditures, it was by far the largest sum ever expended for military purposes in a peacetime year. In part it represented the substantial cost involved in the occupation of enemy countries, but in part it reflected the unsettled condition of international relations and the fact that real postwar disarmament had not yet been achieved.

That the budget of the federal government was likely to remain for a considerable time much above its prewar size was indicated also by several types of expenditures that were outgrowths of the war. Interest on public debt for the fiscal year 1947 was budgeted at \$5,000,000,000, compared to \$3,617,000,000 two years earlier. The cost of veterans' pensions and benefits was estimated at \$6,205,000,000, compared to a little more than \$2,000,000,000 in 1945, and only \$500,000,000 before World War II. The



"Another Man Who Came to Dinner," cartoon by Shoemaker of the Chicago Daily News reflecting the U.S. taxpayers' postwar grievances in 1946. Tax reduction and a decrease in government payrolls was the first pledge given constituents after the Republican landslide in the 1946 congressional elections

new international obligations of the United States were reflected in an item in the budget for international finance appearing for the first time in 1946 with an outlay of \$833,000,000.

This item for fiscal 1947 was estimated at \$3,093,000,000. The influence of the reconversion of the government structure to a peacetime basis could be noted in the general increase in the budget allotments to most of the nonwar functions of government. While government expenditures of a peacetime character were being held in check because of the shortage of materials and manpower in the economy, most governmental functions were incurring increased costs because of the higher level of prices and wages which prevailed and because of certain essential enlargements of government operations. For example, expenditures for aids to agriculture were expected to rise from their wartime low of \$602,000,000 in 1945 to \$1,346,-000,000 in 1947. Similarly, expenditures on public works were expected to advance from \$291,000,000 to \$787,000,ooo for the period. In the area of general government, the trend of outlays was generally upward because of rising wage scales and because various functions performed by war agencies during the war had to be taken over by the regular government departments as the war agencies were liquidated. Whereas expenditures for the civil departments had been \$1,058,000,000 in fiscal 1945, they were estimated at \$1,683,000,000 in fiscal 1947.

Government revenues also began to decline after the end of the war, though to a much less extent than expenditures. Wartime tax rates were substantially maintained in the immediate postwar period, the significant exceptions being the excess profits tax on corporations and a small reduction in the personal income tax. From the high wartime level of taxes in 1945 of \$47,740,000,000, the government's receipts for 1947 were estimated at \$40,919,000,000.

Virtually all of this cut was in the taxes on corporations, which declined from \$16,399,000,000 in the last year of the war to an estimated \$9,762,000,000 in 1947. While there was a decline of more than \$1,000,000,000 in the receipt of taxes on individuals, this was approximately offset by an increase in excise tax receipts flowing from the expansion in civilian goods production.

This policy of maintaining a high level of government revenues in the immediate postwar period as the wartime level of expenditures was being drastically curtailed, resulted in a major cut in the budget deficit. The excess of expenditures over receipts, which was in the neighbourhood of \$56,000,000,000 a year during the war, dropped to \$21,981,000,000 in fiscal 1946, and was expected to be down to only \$1,440,000,000 in 1947. Not since the early years of the 1930s had the budget deficit been so low.

The prewar tendency of the budget and the budget message to reflect the economic programs and policies of the administration was accentuated during the war years. This development took place in countries other than the United States, notably Great Britain, because the huge magnitude of the war programs made it virtually impossible to ignore the repercussions on the economy of the government's fiscal and economic operations. In his 1946 budget message, the president took another step in this direction and showed the trend of his thinking with regard to the postwar responsibilities of the government. This step was the presentation of an analysis in tabular form of the relation between the government's budget and the nation's budget, shown in Table II (p. 443). The data in this table were derived from the statistics of national income and gross national product and were set up so as to reveal the receipts and expenditures of the major economic groups of the nation-consumers, business, state and local government and federal government.

The British Budget.—The budget of Great Britain began to reflect the German threat to peace in Europe from about the middle of the 1930s. Budget expenditures for national defense in the fiscal year 1936–37 of £186,000,000 already represented a sharp increase over the previous year. Defense expenditures were further increased in the two succeeding years and in the fiscal year 1939–40 amounted to £218,000,000 of regular military appropriations plus £408,000,000 that was added in a vote of credit after World War II broke out.

The first war budget of Great Britain, covering the fiscal year 1941-42, was in many respects a revolutionary document; it was based on the economic réquirements of total war. Prepared under the direction and influence of John Maynard Keynes, it was not only an innovation in the scope of its fiscal measures but in its logical presentation of the relation between economic and fiscal needs. It set a model in the art of budget making and presentation that was followed throughout the war by British government, and in fact by other democratic countries, including the United States.

On the side of expenditures, a budgeted total of £4,502,000,000 was provided for, over £4,000,000,000 of which was required for the prosecution of the war. The budget message was concerned primarily with the problem of how this vast sum could be spent by the government for war purposes while avoiding an inflation of prices and the cost of living. It was made clear that this problem had to be met by eliminating the "inflationary gap"—the excess of total private and government expenditures over the total goods and services available for purchase. This emphasis on the inflationary gap represented a conceptual innovation of great importance, for it implicitly recognized that

the budget deficit as such was irrelevant for the problem of war finance. What it meant in practice was that the chancellor of the exchequer was interested in offsetting the inflationary gap, which he estimated at about £500,000,000, rather than the budget deficit of £2,420,597,000. Since closing the gap necessitated a reduction in total expenditures, and since the government expenditure was necessary for the war effort, it was evident that private expenditure would have to be reduced. Otherwise inflation would be inevitable. It was proposed that half the gap be met by increased taxation and half by increased saving on the part of the public.

The new taxes were to be obtained from increased individual and business levies. Under the new rates and lowered exemptions, taxes on the highest income bracket were raised to $87\frac{1}{2}\%$ while at the lower end of the income scale 2,000,000 new taxpayers were affected for the first time. An unmarried worker earning £110 and a married worker with 2 children earning £270 would in 1941 pay an income tax. As a result of the increasing taxes, government revenues were approximately doubled from the fiscal year 1939-40 to 1941-42.

During the remaining years of the war, both government expenditures and receipts continued to rise, although the essential pattern of the budget set in 1941-42 was adhered to. Total expenditures and the vote of credit for war purposes reached their peaks in the fiscal year 1943-44, with figures of £5,789,000,000 and £4,950,000,000, respectively. The peak of revenues, on the other hand, came in the year 1945-46 with a total of £3,284,000,000, more than a third larger than the receipts obtained in 1941-42.

Although the end of the war came with more than half of the fiscal year yet to come, there was little immediate effect upon the British budget for the fiscal year 1945-46. It was not until the following year that any substantial curtailment was effected, and even then the magnitude of Britain's postwar responsibilities for national defense and reconstruction could be readily seen. It was expected that defense expenditures would be curtailed to £1,667,000,000 from the wartime peak of just under £5,000,000,000. However, the civil expenditures of the government were expected to rise to £1,652,000,000 from the previous year's total of £589,000,000.

On the side of revenues, the only significant reduction was in the case of the income tax, where a decline of £270,000,000 was anticipated. Total revenues of £3,161,000,000 were estimated for the fiscal year 1946–47 as compared with £3,284,000,000 in the previous year. (M. GT.)

Europe and the British Commonwealth.—The budgetary figures of the countries of Europe and of the British commonwealth during 1937-46 clearly reflected the secularindeed, millennial-trend toward bigger and bigger figures in almost every sphere of human activity. This trend had been occasionally interrupted by brief periods during which deflationary efforts and economy campaigns resulted in a temporary reduction of the budgetary totals. Such relatively moderate declines had been, however, considerably more than offset by the accentuation of the upward movement during wars. Within a few years, both revenue and expenditure were raised to a multiple of their prewar levels, and even though the termination of wars had been followed by a drastic reduction from the peak reached during the wars, the level at which postwar budgets settled down was usually considerably above the prewar figures.

To this general rule the experience of World War II provided no exception. All countries, whether within or

outside Europe, whether belligerent or neutral, showed a spectacular increase of their expenditure after 1936. Already during the last few years before World War II the abnormal requirements of wartime cast their shadow before them. Practically every nation within striking distance of Germany-which included the whole continent of Europeand Great Britain and its dominions began to arm themselves. In the light of their gigantic war expenditure, the increases in their budgets during 1937 and 1938, and even 1939, appeared moderate in retrospect.

> Table III.—Government Receipts and Expenditures—Great Britain (£ millions)

		,	2					F 15
Receipts	1936-37	1938-39	1939-40	1941-42	1942-43	1943-44	1945-46	Estimate 1946–47
Inland revenue: Income tax	257 54 88 29 — 2 430	336 62 77 21 22 	390 70 78 17 27 1 583	770 75 91 14 22 247 1	1,007 75 93 15 31 347 1 1,569	1,184 76 99 18 33 467 1	1,361 69 120 25 36 431 1 2,043	1,111 80 140 29 325 1 1,686
Customs and excise: Customs	211 109 320	226 114 340	262 138 400	378 326 704	460 425 885	561 482 1,043	570 541 1,111	595 592 1,187
Motor duties	33*	36	34	38	29	27	43	45
Total tax receipts	783	896	1,017	1,962	2,483	2,948	3,197	2,918
Canada government contributions . Crown lands	1 5 11 —	1 6 11 —	1 5 6 —	1 5 14 —	225 1 4 12 5		1 11 5	15 15 5 150
services		13	20	92	90	 78	 70	50 22
Total ordinary revenue	825	927	1,049	2,074	2,820	3,039	3,284	3,161
Expenditures Consolidated fund services: Interest and management of national debt. Other consolidated fund services	211 12 223	217 14 231	223 17 240	257 17 274	311 16 327	365 16 381	456 20 476	490 78 568
Supply services (excluding post of- fice and broadcasting): Navy, army, ordnance and air votes Civil defense Civil, roads and revenue de- partments	186 — 409	254 18 424	218 23 429	‡ 417	‡ . 456	‡ 458	‡ 589	1,667§ 1,652
Vote of credit	595	696	1.078	4,085	4,840	4,950	4,410	
Total ordinary expenditure .	818	927	1,318	4,776	5,296 5,623	5,408 5,789	4,999 5,475	3,319 3,887
Sinking funds	13	13	7 4 492	12	14	10 5	9 7	=
Total expenditures	834	1,068	1,821	4,788	5,637	5,804	5,491	3,887
Self-balancing revenue and expend- iture: Post office and broadcasting	72	79	83	101	103	111	116	121
E. P. T. postwar refunds (part de- ducted for tax)		_	_		_		1	_

*Including Road fund revenue self-balancing in 1936–37. †Included in self-balancing until 1942–43. ‡Met out of vote of credit. \$Including ministry of supply. |Included in civil expenditure until 1938–39.

Related to peacetime conditions, when most governments endeavoured to keep their expenditure within the limits of their revenue, the increases of prewar years were, however, substantial. Unfortunately no authentic figures of German expenditure were available. Nor were the figures for Italy very dependable. Otherwise it would have been possible to show statistically the striking contrast between the modest efforts of the peace-loving nations and the ruthless rearmament drive carried out by the aggressors regardless of expense. While the democratic countries tried to raise their revenue more or less in accordance with their growing expenditure, Germany, and to a smaller extent

Italy, were piling up deficits by thousands of mil-

There was no fundamental change in the budgetary trends during the period known as the 'phony war." Its outstanding characteristic was the gross inadequacy of the economic war efforts of the democracies. The conversion of their industries to war requirements was proceeding at a snail-like pace, not only during 1939 and 1940, but even in 1941. It was not easy for Great Britain and other countries to make good in a few months the omissions of many years. Unaccustomed as they were to planned economy, efficiency in organizing their production drive for a long time left much to be desired. With the best will imaginable, the governments were unable to increase their expenditure to anything like the extent desired. The expenditure figures of the first war years expressed in their terms the inability of munition production to increase output.

From 1942 onward, the expenditure figures of the democratic countries showed a more encouraging tendency. Arms production was gathering momentum, and the amounts spent on it showed a steep

Table IV.—National Budgets (Revenue and Expenditure) of Selected Countries During 1937-46

		Australia South Africa £A 000,000 £S 000,000		Canada Can. \$ 000,000		France Frs. 000,000,000		Italy Lire 000,000,000		U.S.S.R.		Switzerland			
Year			Expenditure		Expenditure		Expenditure		Expenditure				000,000,000		0,000,000
							•				Expenditure	Kevenue	Expenditure	Revenue	Expenditure
1937 .		82	84	43	45	445	387	44	48	25	41	109	103	522	53 <i>7</i>
1938 .		89	90	43	51	501	415	54	52	28	41	127	124	530	578
1939 .		95	98	44	43	502	419	66	67	25	25	156	153	581	633
1940 .		112	140	45	65	541	550	80	80	32	60	178	173	482	
1941 .		150	256	63	119	860	1,148	68	134	34	98	*191	*191		512
1942 .		210	422	81	128	1,464	1.885	*80	*138	41	119			398	458
1943 .		294	697	96	159	2,182	4.387	*102	*128±	48		*183	*183†	374	463
1944 .		342	719	91	178	2,570	5.322	*136	*151 ±	50*	135	*210	*210†	364	<i>507</i>
1945 .	• •	376	642	114*	118*	2,300	5,245	*172			148*	*268	*263†	322	- 530
1946 .	٠.	374*	592*	118*	124*				*214‡	12*	129*	*308	*308†	333	54 7
			347.			2,515	4,650	*289	*271‡	80*	180*	• • •	• • •	331	691
*Estimo	ites.			†Exclu	ding war exp	enditure.	‡	"Civil" bu	dgets only.						

rise. It was not until 1943 or 1944, however, that the peak figures were reached. While Germany from the very beginning of the war produced arms to the limit of its physical capacity, the Allies had to take hard knocks for years, owing to the slow pace at which they managed to mobilize and make the best use of their economic war potential. Once mobilization was complete, the axis was doomed. The rise of expenditure figures during the years 1942, 1943 and 1944 foreshadowed the crushing blows that the Allies would soon be able to deal their opponents.

Budgetary revenue was even slower in rising to its peak level than budgetary expenditure. While the governments of belligerent countries strained every nerve to increase their arms expenditure they were for a long time reluctant to enact the maximum of financial sacrifices from their nationals. In many instances they underestimated at first the willingness of citizens to contribute toward the burden of financing the war. Year after year the British parliament went through the same unusual experience during budget debates: the members of an institution originally created mainly with the object of moderating the appetite of kings for more taxation were criticizing the government for not taxing the country sufficiently.

By 1944, however, in Great Britain as in other countries, the limit was reached beyond which any further increase of taxation would have defeated its object, for it would have led to a decline in production and earnings. By that time a tendency prevailed toward an increase of revenue even in the absence of any additional taxation, as a result of the citizens' growing taxable income brought about by the vast scale of government expenditure, the increase of the number of employed to unprecedented figures and the additional earnings secured through working abnormally long hours. The trend of prices and basic wage rates was also in an upward direction, even though the policy of most governments, which aimed at moderating their use, was remarkably successful.

Notwithstanding the considerable increase of revenue, its total volume necessarily lagged behind the rise in expenditure. A deficit is in fact inevitable in time of major wars. Any attempt at balancing the budget either through keeping down expenditure or through raising revenue to the level of expenditure would have gravely handicapped production and would have been highly detrimental to the major interests of national defense. The remarkable feature of the wartime budgeting figures was the relative smallness of the deficit, especially during the later war years.

The figures available in 1946 for the postwar period were not sufficient to give a clear picture of the postwar budgetary trends. Most countries achieved a reduction of their expenditure but figures showing the full extent of the economies attained as a result of the demobilization and reconversion to peacetime production were not yet available. Nevertheless, it was evident that expenditure would remain very high compared with prewar figures. This was owing in part to the increased burden of public debts, and in part to the permanent increase of non-military expenditure on account of new social security measures and the growth of the civil services necessitated by the extension of government control in the economic field. Military expenditure itself remained high, owing to the determination of most countries to maintain their national defense in a better state of readiness than it was found at the outbreak of World War II.

These general considerations apart, there were in addition particular tendencies affecting the budgets of individual countries or groups of countries. One of these features

was the remarkable financial war effort of some countries of the British commonwealth, overshadowing relatively even the immense effort of Great Britain. The capacity of Canada, Australia and other dominions to take their share in commonwealth defense was not adequately realized until World War II. Their war budget figures showed the mutual character of assistance within the commonwealth since their total financial contribution to the common cause (even with India omitted) bore comparison with that of the mother country.

French budgetary figures indicated the peculiar trends prevailing in the budgets of countries once part of German-occupied Europe. Even though France was out of the war by the middle of 1940, its expenditure continued to grow as a result of the heavy burden of occupation costs. But even its civil budget showed a steep rise. Inflationary tendencies were produced by German methods of exploitation, through which the occupied countries were depleted of their supplies of goods while the Germans created fictitious purchasing power in the hands of the public.

In the U.S.S.R., as in other belligerent countries, civil expenditure underwent a sharp increase during the war. According to the published figures, this expenditure at any rate was fully covered by revenue.

The figures for Switzerland showed the extent of the burden that the war imposed even on neutral countries anxious to defend their neutrality. Although very moderate in comparison with the sacrifices made by belligerent countries, there was an increase of expenditure during the early years of the war, and again at the end of the war. What was more significant was the drop in the revenue, caused in part by the state of mobilization and in part by the decline in earnings caused by wartime conditions which, unlike those prevailing during World War I, were not of a boom-like character.

Many budgets for 1946 showed the effect of the postwar inflation which became a major factor in Europe, overshadowing in importance even such factors as war expenditure or occupation costs. There were a number of countries of which the budget figures surpassed their wartime peaks and were moving toward new high records instead of tending to settle down at a new peacetime equilibrium. (See also Debts, National; Income and Product; Taxation and articles on individual countries.) (P. Eg.)

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Buenos Aires

Buenos Aires, capital of Argentina, is located on the southwest bank of the Plata estuary. The city is the natural centre of the fan-shaped pampas region which forms its hinterland and is one of the richest agricultural areas in the world. Estimated population in 1945 was 2,608,333; earlier estimates were: 1941 (municipal census), 2,515,726; 1943, 2,557,586; 1944, 2,595,861. With suburbs included, the total population was almost 3,500,000; Avellaneda,

with a 1944 population of 399,021, is the largest and most important of the suburbs. Buenos Aires is the largest city in Latin America, the largest in the southern hemisphere, and the largest Spanish-speaking city. It is South America's largest port and Argentina's most important industrial and cultural centre, long noted for its cosmopolitan atmosphere. In terms of spacious and well-improved streets, beautiful public buildings, parks and recreation facilities, Buenos Aires is one of the notable cities of the hemisphere. Much of the municipal improvement was accomplished during the decade 1937–46.

The program of urbanization undertaken by municipal authorities led them in 1937 to plan floating a bond issue in New York city for the purpose, but the issue was subsequently made and subscribed in Buenos Aires on Aug. 6, 1937. Certain financial questions later led to the suspension of Buenos Aires bonds on the New York Stock exchange on Oct. 2, 1937; quotation of the issues was removed entirely the following year. Reorganization of the municipal police department occurred in June 1940 following charges that some of its members had failed to co-operate in the local investigation of nazi activities. Difficulties between local and national authorities came to a head late the following year, when the national cabinet council, under the chairmanship of Acting President Ramón S. Castillo, dissolved the municipal council on Oct. 10, 1941, because of various scandals that had characterized the municipal government. The ousted council later met in a Buenos Aires café and appeared to be supported by a considerable segment of local public opinion. Buenos Aires leaders of the Radical party denounced Pres. Castillo for the action, and the ousted council members announced their intention to appeal the removal to the national supreme court. Efforts to regain their seats proved unsuccessful, however. The coup d'état on June 4, 1943, which led to the supplanting of Pres. Castillo by an army group, resulted in the resignation on June 7, 1943, of the municipal alcalde or mayor, Carlos Alberto Pueyr-

Citizens of Buenos Aires celebrating the victory of Juan Perón in the 1946 presidential election. Final tallies gave Perón 304 electoral votes, and 72 to his opponent, José Tamborini



redón. Gen Basilio Bertine was appointed on June 12 as his successor. During the presidential campaign in 1945–46, culminating in the election of Feb. 24, 1946, Buenos Aires was the scene of repeated political disorders and rioting, engendered especially by the activities of the descamisados (shirtless persons) supporting Juan D. Perón for the presidency.

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Building and Construction Industry

At the beginning of the decade 1937–46, the volume of U.S. construction activity was greatly influenced by the pump-priming public works program, and by a revival of home building. In 1940, the defense program spurred industrial building. With the advent of World War II, the U.S. was a beehive of construction activity, concentrating upon war needs—factories and camps, farm service buildings, homes for workers in war industries and military encampments. With the cessation of hostilities, industrial, commercial, residential and public works interests all wanted to build. There were not sufficient quantities of building material, so industrial, commercial and public works activities were curtailed by governmental order and residential construction was encouraged.

Table I.—Construction Activity, Continental United States, Selected Years
[Millions of Dollars]

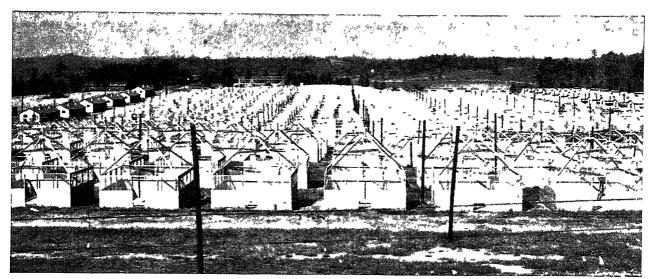
1 st

	1937	1939	1941	1040	1044	1015	Half
Takat	1737	1737	1941	1942	1944	1945	1946*
Total new, work relief, and maintenance	0 224	10.420	15,108	177/7	0 504	0240	
				-		•	
Total new construction	5,308	6,060	10,584		4,197		
Total private	3,274 1,372	3,619 2,114	5,238 2,765	2,908	1,746 535		3,355
Nonresidential	1,088	785	1,486	1,315 635	350	670	1,357
Industrial	492	254	801	346	208	1,014	1,508 734
Warehouses, office and			•••	040	200	042	/ 54
loft buildings	128	76	114	57	16	52	114
Stores, restaurants and							
garages	250	211	286	93	39	147	431
Other nonresidential .	218	244	285	139	87	173	229
Farm construction	225	226	303	271	213	191	120
Residential	118	120	174	144	136	116	t
Nonresidential	107	106	129	127	77	75	
Public utility	589	494	684	687	648	672	370
Telephone and tele-	199	137	1 <i>87</i>	197	247	264	120
graph	102	93	179	155	83	117	118
Other public utility	288	264	318	335	318	291	132
Total Public	2,034	2,441	5.346	10,656	2,451	2,050	689
Residential	93	76	479	600	190	7,000	52
Nonresidential	459	792	1,667	3,742	879	822	142
Industrial	2	18	1,400	3,571	748	640	43
Educational	221	399	131	86	41	59	38
Hospital and institu-							
tional	62	109	29	29	58	85	43
Military and naval	174 37	266 119	107	56	32	38	18
Highway	850	869	1,756 836	5,060 664	720 360	562 302	8 7 210
Sewer and water	174	162	168	139	79	97	61
Misc. public service enter.	ioī	91	63	36	46	55	34
Conservation and devel-		• • •		•	40	. 55	34
opment	310	318	350	360	163	130	88
All other federal	10	14	27	55	14	11	15
Work relief	775	1,032	627	291	‡	‡	‡
Maintenance	3,243	3,346	3,897	3,892	4,399	4,771	Ť
*D., . 11 1							

Not available.

Source Construction division, department of commerce Figures for 1944, 1945 and 1946 are joint estimates of the department of commerce and department of labour Figures for private residential (excl. farm) are department of labour estimates in all years.

According to the department of commerce survey of current business, public works during 1938 accounted for 47% of the total construction, compared with an average of 22% during the 1920–29 decade and 41% in 1937. Residential building also proved to be a great bulwark to business recovery. The number of family dwelling units upon which construction was started was the greatest since 1929. The Federal Housing administration (FHA) mortgage guarantee system was given credit for creating this activity



The building industry was called upon during the early years of World War II to provide vast housing facilities for army trainees at camps throughout the U.S. Above, Fort McClellan, Ala., nearing completion in 1940

and for emphasis upon the construction of a volume of moderately priced homes to meet moderate income demands. The United States Housing authority, created in 1937 to make loans and grants to localities for housing for low-income families and for slum clearance, inaugurated its program in the early years of the decade and was in full flush of activity when the United States entered World War II.

But the year 1942 saw an almost complete cessation of construction in the U.S. except for military or war production purposes. All normal construction of industrial, commercial, residential and public works was stopped. In order to build, it was necessary to apply for materials priolities, which were granted according to the military importance of the contemplated project. A No. 1 priority was certain to produce materials. A No. 4 priority was often merely a hunting licence.

Normal construction was stopped because material and manpower were required for the war effort and there was not enough of either to serve normal and war purposes. In order to save materials, the National Housing agency (NHA) and the War Production board (WPB) restricted home building by (1) giving priorities for building only for workers in areas where there were no available dwelling units; (2) curtailing the number of family dwellings built; (3) curtailing the amount of critical material used in family dwelling units; (4) programming a large quantity of temporary family dwelling units using less critical material than permanent units would use, and a large quantity of dormitory units and apartments using less critical material per person than would be used in family dwelling units; (5) urging the conversion of large single family houses,

lofts, office buildings, etc. to multifamily use; (6) urging families in war production areas to rent all spare rooms to war workers; (7) encouraging builders to use substitute materials.

Public construction expenses rose during the war years. Outlays for military and naval construction from Jan. 1940 to Aug. 1945 totalled \$10,895,000,000. Publicly-financed industrial facilities totalled \$8,445,000,000. Outlays for educational, hospital and institutional, other nonresidential building, highway, sewer and water, and miscellaneous public service enterprises were \$5,570,000,000. Permanent and temporary publicly-financed war housing totalled \$2,220,000,000.

During the war, the shortage of critical materials encouraged experimentation with new methods of construction, new materials and new ways of using old materials. The incentive to experiment was provided by the necessity of saving metal, lumber and certain plastics for the materials of war; by the importance of speed and quantity production; by the need to use a minimum of manpower, and by the knowledge that a large postwar market would be attainable if the cost of production could be reduced.

The shortage of materials continued after the war's end. The demand was greater than the normal supply and in most instances the supply was far below normal. There were many reasons for the subnormal supply. War requirements had demanded different specifications, and factories had to reconvert to peacetime stocks. In reconverting, they chose to manufacture the types of supplies which carried the greatest profits and they did not make those items which were less profitable; they could keep their plants busy with the more profitable articles (nails were in this category and were not produced until after strenuous efforts). The Office of Price Administration (OPA) trying at first to avoid inflation, refused to make the price adjust-

														_	•
				Т	able II.—Prod	luction of Se	lected Buildi	ing Materio	ıls, 1937 Th	rough April	1946				
		Lumber	Hard-	Soft-	Brick un-	Unglazed		Asphalt	Clay		Radi	iation (MM	sq. ft-)	Warm	
Ye	ear	total pro- duction (MM bd. ft.)	flooring (MM bd. ft.)	wood plywood (MM sq. ft.)	glazed com- mon and face (MM bricks)	clay struc- tural tile (M tons)	lath ship- ments (MM sq. ft.)	materials		Cast-iron soil pipe (thousand tons)	Total	Cast iron	Convec- tor	air fur- naces (thou- sands)	Wire nail shipments (thousand tons)
1937 .		29,004	563	<i>7</i> 25	4,190	1,353	1,124	44	973	352	n.a.	n a.	n.a.	392	57°6
1938 .		23,414	600	650	3,533	1,150	1,181	n.a.	870	na.	n.a.	n.a.	n.a.	350	n.a.
1939 .		28,795	760	1,007	4,726		1,548	35	1,076	295	67.5	60.2	7.3	439	679
1940 .		31,170	880	1,200	4,096	1,035	2,031	34	907	n.a.	83. <i>7</i>	<i>77.</i> 0	6.7	531	641
1941 .		36,538	960	1,680	4,938	1,125	2,777	44	1,148	565	91.1	84.1	7.0	568	782
1942 .		36,330	640	1,840	3,388	1,045	2,428	56	1,380	n.a.	64.1	59. <i>7</i>	4.4	281	845
1943 .		34,622	352	1,495	1,918	845	2,305	53	927	150	34.7	31.0	3.7	198	849
1944 .		32,554	344	1,485	1,879	<i>7</i> 16	2,116	65	739	165	21.9	17.4	4.5	294	673
1945 .		27,951	352	1,223	2,290	739	2,093	64	698	202	24.3	16.9	7.4	365	642
1946-				•	-		•								
Januar	y-April .	9,449	n.a.	435	1,247.9	310.9	908	23.0	257.6	109.9	14.61	8.97	5.64	167.0	156.3
	Not availal										-				
Source	Housing-	-June 1946	S Publicati	ion of NHA	١.										
1946- Januar n.a.—N	y-April . Not availal	9,449 ble.	n.a.	435	1,247.9	739 310.9		23.0	698 257.6	202 109.9	14.61		7.4 5.64		642 156.3

ments which the trade thought necessary; many price adjustments were considered too small. Strikes kept basic industries like the steel industry idle. Table II gives a comparison of production of key materials for the years 1937-46.

Because the demand for building materials exceeded the supply, it was possible for black marketeers to thrive. Government regulations were circumvented. It was estimated that 75% of the supplies found their way to the black market. In some areas as much as 95% of some materials found its way into the black market.

In an effort to step up construction and the production of building material, and to pursue the war-born effort to find substitutes for scarce items, congress passed the Veterans Emergency Housing act on May 22, 1946, providing among other things for \$400,000,000 in premium payments for scarce materials and market guarantees for new materials and factory-built houses. Premium payment programs to increase the output of brick, structural tile, plywood and gypsum-board paper liner were started in June; of northern and southern hardwood flooring, convector radiators, and iron soil pipe in July.

The increase of more than 3,600 tons of merchant gypsum liner in July over April was attributed by the housing expediter, Wilson W. Wyatt, largely to the premium payment plan, authorizing payments of \$40 a ton for production of liner in excess of quota. Computed on the basis of one ton of liner to 12,500 sq.ft. of board and lath, sufficient for five homes, it was estimated that the increase could provide for more than 18,000 veterans' homes. But the increased production of liner did not have immediate home-production effect because there was a lag between its production and the production of finished board and lath.

Brick production jumped 11% in June 1946, the first month of operation of the premium payment plan, and rose an additional 17% in July.

Production of cast-iron soil pipe, termed "the most critically short of all building material" was aided on Aug. 7, 1946, by a \$40 per ton premium for all Saturday production in excess of quota, providing that Saturday was the sixth day worked during the week, and \$10 per ton for all other production in excess of quota. Previously, the industry had found it unprofitable to produce beyond a five-day week, so the \$40 Saturday premium was conceived to compensate producers for extraordinary expenses incurred in a six-day operation.

To expedite lumber production, the national housing expediter made \$10,500,000 available in June and July 1946 to the secretary of agriculture for the immediate start of construction of access roads to out-of-the-way government timber lands. The new roads were expected to add about 90,000,000 bd.ft. to the 1946 production and 500,-000,000 to 600,000,000 bd.ft. in 1947. The money was allocated from \$15,000,000 made available for access road construction under the Veterans' Emergency Housing act of 1946. An allotment of \$1,234,000 was made in August to the secretary of the interior to construct 222 mi. of access roads to out-of-the-way timber lands on Indian reservations. Wyatt also announced two additional premium payments covering southern and northern hardwood flooring industries. His regulations authorized manufacturers of southern flooring lumber participating in the premium payment plan to pay bonuses of \$8.50 per 1,000 ft. board measure for seasoned lumber, and \$6.00 for 1,000 ft. for green lumber to their suppliers of certain grades and species of hardwood lumber; and manufacturers of northern flooring lumber to pay bonuses of \$3.50 for seasoned and \$1.00 for green. The producers were to be reimbursed in full (Premium A) for what they paid in bonuses to lumber suppliers if their quarterly production rose 10% or more above their established quotas. There were other provisions for reimbursement in full or in part under certain conditions. Adjustments were also made in OPA ceilings.

The housing expediter also entered into an agreement with the state of Washington whereby the federal government would compensate the state for expenses incurred in doubling the number of its "timber cruiser teams"—the men who examine the forests, estimate the volume of timber and perform related duties necessary to prepare offerings of timber. It was estimated that large amounts of Douglas fir, hemlock and ponderosa pine could be offered for sale through the use of additional cruiser teams.

Premium payments and a 10% price increase were given to spur production of convector radiators used for residential heating. The premium provided incentive payments for production in excess of quota of ten cents per "shipment unit" (a sq.ft. of steam radiation obtainable from such convector radiators, as determined by standardized industry ratings).

The housing expediter announced plans for assisting the unconventional as well as conventional builder and the developer of new materials as well as the supplier of existing materials.

The number of manufacturers seeking approval for FHA mortgage insurance of factory-built houses and parts of houses increased substantially with the inception of the Veterans' Emergency Housing program. After March 1, 1946, FHA approved approximately 85 types of such construction as eligible for FHA mortgage insurance. Nevertheless, the production of factory-built homes did not come up to expectation in the first half of 1946.

As material production was being increased in 1946, labour supply was tightening, and a grave construction labour shortage was becoming apparent. To produce 2,700,000 homes it was deemed necessary to triple the Jan. 1946 construction labour force by the middle of 1947. To do this it was necessary to recruit and train 1,500,000 additional workers-not an easy task in the light of apprenticeship requirements and union hesitance to increase ranks beyond the number which they could be expected to carry when construction would return to normalcy. Total construction employment reached 2,250,000 workers in July 1946; 143,000 workers were added that month. The construction volume was about 21/2 times the 1945 volume, the gain being attributed almost entirely to increases in privately-financed work. Public construction in 1946 was largely highway construction and veterans' temporary housing.

Rising construction costs caused laymen, financiers, and builders to wonder about a sustained building boom. Some forecast a buyers' strike. Prices on both homes and building lots rose on a national average from 60% to 65% between 1941 and 1946. From Sept. 1945 to July 1946, the national price rise on building lots and raw land was at the rate of 60% a year. Many people thought that this trend would bring future headaches in its wake. (See also Business Review; Housing.)

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Building in Britain.—The years 1937 to 1939 were years of great activity in the British building industry, but the outbreak of World War II brought normal building to a

standstill. The enormous program of work connected with the war effort was carried out under conditions which were, in almost every respect, abnormal. This program occupied the major part of a steadily decreasing labour force until the end of 1943; during 1944 the clearance and repair of bomb-damaged property, mainly in southern England, assumed first importance in the allocation of priorities. This phase merged imperceptibly into the drive to provide increased living accommodations; this was the principal preoccupation of the industry during the early postwar period. The organization of a rapidly increasing labour force made this period highly abnormal, an effect which was intensified by the increasing influence of changes which had occurred during the war years.

The development of building research had been accelerating noticeably after 1914, and by 1937 its results were significant. Its influence was greatest in the field of manufactured products, where the organization of industry most favoured its application. Wartime conditions saw a concentration on those constructional operations most susceptible to modification; they also brought shortages of certain materials, notably timber, which forced the industry to adopt substitutes and the modifications of construction which they implied. The use of factory-made units to accelerate erection of buildings made some progress, but the change from normal methods was a very difficult one, and the end of 1946 found much of this work still at an early experimental stage.

The ministry of health Model Bylaws (1936) had been intended as a means of standardizing and bringing up to date local building regulations, and the period 1936–39 had seen some progress with this work. Wartime construction for special purposes used methods which would not normally have been permitted, and their apparent success led to the claim that existing methods of control of building were unnecessarily restrictive and extravagant. Concentration of building under central control during the war years undoubtedly assisted the adoption of many new formally defined standards for the quality and performance of building materials and components; the number of published British standards applicable to building work increased from 73 in 1936 to 103 in 1939 and 220 in 1946.

Another important move was made in 1942, when a number of study committees were set up by the minister of works to formulate codes of practice for various sections of building practice. Important developments were expected in postwar years from attempts to reduce the manhours associated with the production of buildings by increasing use of factory-made components and mechanical plant on building sites, and by attention to organization of site labour operations.

The comparative prosperity of the British industry during the period 1937-39 drew attention to the fact that its working conditions did not, in many trades, attract the best type of entrant. The National Joint Council for the Building Industry introduced certain improvements, principal among which were a "holidays with pay" scheme and the establishment of a "guaranteed week." Bricklayers and other tradesmen working on building sites had been liable to considerable loss in wages when bad weather interfered with their work since, in the majority of cases, they were paid only for the actual time during which work was possible. The guarantee of payment for a minimum number of hours per week came first in connection with wartime contracts, but a guaranteed week of 32 hr. was continued when civil building recommenced. The hourly rate for skilled craftsmen in the London area increased from 1s.8d. in 1936 to 1s. 101/2d. in 1940 and to 2s.71/2d. in 1946. A system of bonus payments was introduced with the object of increasing output on certain war contracts. The system was not altogether new and, in certain quarters, continued to be favoured; taking the industry as a whole, however, it was not popular and did not remain in general use after the end of the war.

Large wartime contracts made it possible to give building workers welfare facilities and there was considerable official encouragement for this trend. With the return of more normal contracts, the difficulty of maintaining this provision reappeared and in 1946 it could not be said that any great progress in this direction had been made. Management had, however, by then appreciated that shortage of skilled men in the building industry faced it with a problem more acute than it had previously experienced and that everything possible should be done to sustain the improvement in working conditions brought about by the war if individual firms and the industry as a whole were to be adequately manned.

The postwar personnel problems of the industry were anticipated at a comparatively early stage of World War II. An important study of the building labour force and its postwar expansion appeared in 1941. In the same year Lord Reith set up the Central Council for Works and Buildings to advise him on matters concerning the industry, and recruitment and training were among the first deliberations. At the same time the machinery of the National Joint council of the industry drew up a national scheme of apprenticeship to regulate the recruitment and training of young employees in the skilled trades. The publication in 1942 of a White Paper dealing with the same subject provided opportunity for general consideration of the requirements of the industry and led to the establishment in the same year of the Building Apprenticeship and Training council. Even before the establishment of this last body, the board of education, at the instigation of the ministry of works, had urged local education authorities to extend the provision of junior technical schools for building. The response to this request was notable, and the annual entry to such schools rose from some 300 in 1942 to 6,000 in 1944. Previous experience had shown that such schools provided a very high grade of entrant to the industry and the expansion of their numbers constituted a valuable advance in attraction of the right type of entrant. By 1946, the national scheme of apprenticeship and the Building Apprenticeship and Training council had gone a considerable way toward establishing themselves as permanent features of the industry. Provision was made for the entry into the industry of ex-service men who had undergone special shortened courses of training at ministry of labour government-training centres.

A survey carried out in 1941 by the ministry of works and buildings provided, for the first time, a definite picture of the structure of the industry which, it had long been realized, was unusual in so large an organization. The preponderance of small firms employing fewer than 20 men was used as an argument to support the proposition that organization and management were on the whole less efficient in building than in other large industries.

Survey of Building Industry in Great Britain, 1941

					rer c	ent of	Pet	' cent		
				Number	Work	people	of c	lericals	Total per cent	
Size of firm				of firms	Craftsmen	Labourers	Male	Female	employed	
0-19				79,985	13.0	7.2	1.0	0.9	22.1	
20-99				5,371	11.1	9.3	0.7	0.6	21.7	
100 or over .	•	٠	٠	1,224	20.2	33.1	2.1	0.8	56.2	
Totals				86,580	44.3	49.6	3.8	2.3	100	

In 1942, the ministry of works arranged for a mission to visit the U.S.A. to study building methods there. In its report, the mission supported the view that attempts should be made to improve the organization of building contracts in Great Britain. The employers' organizations held that improvements were most likely to result from more complete preparation of a project before inviting tenders and from the avoidance of modifications introduced during the progress of the work, a view which the mission had also expressed in its report.

Fixed price contracts based on a common bill of quantities were general before 1939, but the acceptance of lowest tenders was not altogether satisfactory. In some areas there was a tendency for employers to associate in an attempt to distribute contracts at suitable prices. The instability of conditions during the period 1939-46 resulted in payment being arranged on a "cost-plus" basis, but experience of this method did not suggest that it was suitable for more stable times. Payment for the repair of war damage was arranged on a common schedule of prices drawn up by the ministry of works in consultation with members of the industry but, in practice, many aspects of the working of the method were open to objection. The immediate postwar period was too transitional in character to provide suitable opportunity for experiment in methods of payment; there were, however, some advocates for "fixed fee" contracts whereby a contractor's profit could be fixed and his own interest trusted to secure early completion of the work.

The prospect of labour shortages increased the attention given to the selection of foremen and other problems of supervision. It was, felt that wartime conditions had resulted in a reduction of individual output and there were those who believed that production methods in other industries could be usefully applied to building.

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Bukovina

See RUMANIA; UNION OF SOVIET SOCIALIST REPUBLICS.

Bulb Flowers

See Horticulture.

Bulgaria

Bulgaria, a nation in the Balkans, had an area of 39,814 sq.mi. in 1940 with a population of about 6,370,000. Of the territories acquired after that date, only the southern Dobruja, ceded on Sept. 7, 1940, from Rumania, an area of c. 2,900 sq.mi. with a population of 350,000, was to remain Bulgarian. Capital: Sofia. Chief cities: Sofia (est. 1942) 401,000, Philippopolis (Plovdiv) 99,883, Varna 69,944, Russé (Ruschuk) 49,447, Burgas 36,230, Plevna (Pleven) 31,520. Religion: mainly Greek Orthodox; about 1,000,000 Moslems; before 1941 there were about 50,000 Jews.

At the beginning of the ten eventful years, in 1937, Bulgaria represented a moderate royal dictatorship. King Boris III limited the parliamentary influence. On July 4, 1936, Georgi Kiosseivanoff had been appointed prime min-

ister and minister of foreign affairs. On Oct. 21, 1937, a new electoral law was promulgated, providing for universal suffrage for both sexes (an innovation in Bulgaria). Communists, adherents of violence, state and communal functionaries, and persons without gainful occupations were excluded from the passive suffrage. No party nominations or party candidates were allowed.

Early in 1938 there was considerable excitement owing to the continuance of the authoritarian regime. In March, elections—the first after the constitution was suspended in 1934—returned 104 government supporters against 56 of the opposition. On May 22 parliament was opened, and the decree-laws of the preceding four years were confirmed.

In foreign affairs the government sought friendlier relations with Bulgaria's neighbours. A decisive step was taken along the road, entered upon some three years previously, of reconciliation with Yugoslavia by the signature, on Jan. 24, 1937, of a treaty, article I of which simply declared that "there will be inviolable peace and sincere and perpetual friendship between the kingdoms of Yugoslavia and Bulgaria." In fact, relations between the two countries became cordial, and the barbed-wire entanglements on the frontier were removed. The Internal Macedonian Revolutionary organization seemed to have lost its power. A further step in that direction was the signature of the Salonika agreement with the Balkan Entente (July 31, 1938). The latter renounced, so far as the Entente members were concerned, the clauses of the Treaty of Neuilly limiting Bulgaria's armaments, and also the clauses of the Treaty of Lausanne demilitarizing certain zones on Bulgaria's frontiers. The signatories bound themselves to mutual nonaggression. The agreement (which the other interested states accepted) was hailed with rejoicing in Bulgaria, where conscription was re-introduced and rearmament was initiated openly.

The early months of 1939 passed quietly in Bulgaria. Her relations with Turkey and Yugoslavia continued good, but the Rumanian dispute over the Dobruja kept Bulgaria from joining the Balkan Entente. In spite of the overwhelming importance of its trade with Germany, Bulgaria did not accept an offer made by that country in Oct. 1938, to take over all its export surpluses for 12 years in return for German manufactured goods and services. Relations with the U.S.S.R. also improved remarkably, and there were negotiations for increasing the trade between the two countries. On the outbreak of World War II, Bulgaria declared a policy of strict neutrality, but public opinion clearly felt the time approaching when Bulgaria's claims against Rumania in the southern Dobruja could be pressed, and unlike her neighbours, she hailed with some enthusiasm the return of the U.S.S.R. to an active imperialist policy resembling that of pre-1914 Russia. It was Bulgaria's attitude which formed the chief obstacle to the formation of a neutral "Balkan bloc."

Pro-Axis Shift in Foreign Policy.—But in 1940, with the growing success of the axis, Bulgaria inclined more and more toward a pro-German policy, through which she also hoped to satisfy her territorial aspirations. Economically, Bulgaria soon passed under German control. Although she accepted some aspects of nazi policy, including the introduction of the first anti-Semitic legislation in Bulgaria's history, nevertheless she did not join the axis alliance.

King Boris tried, as long as possible, to maintain a neutral attitude. In view of the strained internal situation the king dissolved the parliament, and new elections were held in Jan. 1940. Hopes that the new parliament would be less reflective of the oppositional attitude of the people

were not realized. The government, of course, received the majority of the votes, but this majority was much smaller than expected. Under these circumstances, Prime Minister Georgi Kiosseivanoff, who had ruled the country as the king's confidant for four years, resigned and the minister of education, Bogdan Philoff, an archaeologist and scholar of renown, formed the new government with Ivan Popoff as foreign minister and Ivan Bagrianoff, a declared friend of fascism, as minister of agriculture. The new parliament was opened on Feb. 24, 1940. The only important piece of legislation passed during the spring was a bill re-introducing compulsory military service for all men between the ages of 17 and 65, thus abolishing finally the disarmament clause of the peace treaty of Neuilly.

Re-acquisition in Sept. 1940 of the southern Dobruja, which Bulgaria had ceded to Rumania in the peace treaty of Bucharest in 1913 at the end of the second Balkan War, was greeted enthusiastically by the Bulgarians. The weakening of Rumania under heavy pressure from Germany, the soviet union and Hungary gave Bulgaria the opportunity to re-annex the land without any actual warfare. Southern Dobruja, with a predominantly Bulgarian population, represents a relatively fertile land between the lower Danube and the Black sea; the population includes strong Turkish and Rumanian minorities, the latter to be exchanged for the Bulgarian minority remaining in the northern Dobruja region. On Dec. 29, 1940, the parliament expressed support of the government's foreign policy, which the foreign minister defined as aimed at keeping the country out of war while defending the nation's "vital interests."

These "vital interests"-the fulfilment of Bulgaria's dream of a great Bulgarian empire within the frontiers of the peace of San Stefano (1878)-aligned Bulgaria openly with the axis powers in 1941. Premier Philoff stressed in a speech on Jan. 12, 1941, that Bulgaria should not be influenced by any sympathies but that its policy should be guided by "Bulgaria first" principles, working only for Bulgaria, and never sacrificing anything for allegedly foreign interests. This speech prepared the Bulgarian public for a "neutrality" policy which brought Bulgaria closer and closer to the axis. Soon it became clear that the so-called neutrality policy of the Bulgarian government favoured the entrance of German troops into Bulgaria, thus facilitating their plans of potential aggression against Yugoslavia, Greece and Turkey. The official press clamoured for Greek Thrace, including the area between the rivers Mesta and Struma and the port of Kavalla. As early as Feb. 14, 1941, the Bulgarian foreign office had to admit that the country had agreed to let German armies march through to the Greek border. On March 1 the Bulgarian cabinet had officially decided to sign the axis tripartite pact; accordingly, Premier Philoff and Foreign Minister Ivan Popoff flew to Vienna, where they formally signed the treaty with Germany which gave the Germans the official right to occupy Bulgaria. On the same day the German armies crossed the Danube from Rumania, and from that moment on, the country was fully in axis hands.

German Occupation.—Thereupon, the Allied diplomats left Sofia, while mighty German columns rolled through the land. All liberal and democratic elements in Bulgaria, as well as all those who were in sympathy with the U.S.S.R., went into hiding or were arrested. While the Germans took up positions on the Greek and Yugoslav borders, the Bulgarian army was mobilized along the Turkish frontier. Although, according to the Bulgarian premier, the task of the German troops in Bulgaria was "to safeguard"

the peace and tranquillity of the Balkans," in reality they had gained those strategic positions which allowed them, in the beginning of April 1941, to deal quick and decisive blows to Yugoslavia and Greece.

As soon as the German troops smashed into Yugoslavia and Greece and defeated the armies of these two countries, Bulgarian troops, which had not participated in the fighting or conquest themselves, began to occupy part of the Greek and Yugoslav territories conquered by the Germans, especially Thrace and Macedonia. To the seven provinces of Bulgaria three new ones were added-those of Bitolj, Skoplje and Xanthi-while the former Serb districts near Pirot and Tsaribrod were incorporated into the province of Sofia. Thus Bulgaria acquired a large additional territory in which the Greek and Serb inhabitants were subjected to systematic persecution. The territory gained from Yugoslavia was estimated at 10,039 sq.mi. with about 1,500,ooo people, and was economically important on account of its tobacco and opium. From Greece, Bulgaria temporarily gained Greek Macedonia with about 9,884 sq.mi. and 1,600,000 inhabitants, and western Thrace with 3,364 sq.mi. and 350,000 inhabitants, both areas containing important silk, tobacco and olive production and a relatively well-developed industry. With this conquest achieved and Macedonia united under Bulgarian rule, parliament amnestied the former Macedonian revolutionaries, among them Ivan Mihailov, the head of the I.M.R.O. After June 1941 German aggression against the soviet union brought forth strong sympathies for the U.S.S.R. and popular feeling remained strong enough to prevent Bulgaria from an open participation in the war against the soviet union. Some of the Bulgarian liberals succeeded in escaping and organized abroad a free Bulgar movement under Kosta Todorov.

The Bulgarian government did, however, declare war on Britain and on the United States of America, and its policy went so far as to suppress all Rotary clubs and Y.M.C.A. organizations and to liquidate their properties. Though the number of Jews in Bulgaria amounted to much less than 1% of the total population, the anti-Semitic legislation closely imitated the national socialist laws and practice. Similarly there were bitter complaints from the Greeks and Serbs in the newly-occupied countries about the harshness and cruelty of the Bulgarians.

At the end of March 1942, King Boris visited Adolf Hitler, who demanded active support by Bulgaria in the Russian campaign. But Bulgaria refused to approve the far-reaching demands of Hitler. As a result the cabinet resigned on April 11. The foreign minister, Ivan Popoff, and the minister of war, General Theodossy Daskaloff, did not join the new cabinet formed by Premier Philoff. The premier became foreign minister, and General Nikolai Mikhov, commander of the army corps of Sofia, became minister of war. The powerful ministry of the interior remained in the hands of Peter Gabrovsky. It was decided to celebrate April 12 of each year—the date of the union of Macedonia and Thrace with Bulgaria—as the day of the unification of Bulgaria.

The strength of the unrest in the country was shown when several leading Bulgarians, among them General Vladimir Zaimoff, former minister of the interior, were executed as "tools of bolshevism." The unrest grew with the loss of German prestige following the successful resistance of the Russians. At the end of March 1943, King Boris again visited Hitler at the latter's field headquarters; they tried to arrive at closer collaboration between the

two countries. The king's return to Bulgaria provoked a crisis, for the Russian successes on the eastern front had strengthened the pro-Russian sentiment of the people. The king found himself forced to assume de facto charge of foreign affairs, while Bogdan Philoff became undersecretary of foreign affairs. In many of the larger towns a state of siege was proclaimed. But all these measures did not bring internal peace. Violent demonstrations were held throughout the country on May 1, in spite of many preventive arrests, and Boris had to leave the capital in haste on the advice of his government. The unrest frequently took the form of the assassination of prominent pro-axis personalities. Among them was Col. Athanas Panteff, former chief of police, whose national funeral services, held on May 4, were followed by widespread rioting with a heavy death toll. Other prominent victims of Bulgarian patriots' terrorism were Sotir Janeff, a close personal friend of the king, president of the foreign affairs commission of the parliament and editor of the semiofficial Slovo, and Gen. Christo Lukoff, a former minister of war, both fervent friends of Germany and extreme Bulgarian nationalists. These assassinations were followed by that of Sapria Klevkoff, a member of parliament and, as it was reported, the 110th Bulgarian political supporter of Germany to die at the hands of terrorists.

King Boris III died on Aug. 28, 1943, in Sofia after four days of suffering of unexplained origin but which was reliably reported to have been caused by a shooting at a small railway station outside the capital, when the king was returning from another of his visits to Hitler. His six-year-old son, Prince Simeon of Tirnovo, ascended the throne under the name of Simeon II. It was generally believed that Hitler had put before the king two urgent demands, one for full powers for the gestapo to repress

Bulgarian unrest and the other for fuller Bulgarian participation in the war. After the death of the king a regency council was appointed, consisting of Prince Cyril, Premier Philoff and Minister of War, Gen. Nikolai Mikhov. The Bulgarian army, irrevocably committed to a pro-German policy, backed the continuation of a determined pronazi policy, in which Minister of the Interior Peter Gabrovsky was the strong man.

Effect of Allied Military Successes.—The war was brought home to the Bulgarian people by heavy raids of U.S. and British bombing planes over Sofia which resulted in a large-scale evacuation of the capital. The heaviest raids occurred on Jan. 10 and March 16, 1944. Many Bulgarians expressed their opposition to the government policy, among them the Democratic party under Nikolai Mushanov with its very strong pro-Allied sympathies, the Pan-Slav Zveno group and the communistinspired Otechestven group to which also the active guerrillas, the Shumatsi, belonged.

The Bulgarian council of regents was determined to follow its German policy, but the victorious Russian advance toward the Danube more than counteracted German pressure. Germany's demand to break off relations with the U.S.S.R. and to throw Bulgaria's army of 500,000 men into the war against the red army was unavailing. By the middle of Aug. 1944, the internal situation had so deteriorated that even Premier Bagrianov was forced to move for peace. On Aug. 17 he declared before the Bulgarian parliament that the majority of the Bulgarian people never wanted to interfere in a large-scale conflict between great powers. On Aug. 22 the foreign minister, Parvan Draganov, was even more outspoken in his speech before parliament, stressing his country's friendly relations with the U.S.S.R. and describing the declaration of war against Britain and the U.S. as a mistake. At the





same time regret was officially expressed for the anti-Semitic legislation. All official German propaganda in Bulgaria was stopped, exports to Germany were cut and political prisoners were released. On Aug. 30 a Bulgarian armistice delegation arrived in Cairo.

A new democratic and pro-Allied government under Constantine Muraviev and the veteran Bulgarian democratic leader Nikolai Mushanov was formed three days later. It immediately liberated political prisoners, disbanded all pro-fascist organizations, broke relations with Germany, denounced the anti-Comintern pact and revoked all anti-Semitic laws. But suddenly, to the general surprise, the new government was faced on Sept. 5 with a Russian declaration of war, which was officially motivated by Bulgaria's refusal to break completely with Germany. The Bulgarian government declared war on Germany on Sept. 8, after having immediately asked an armistice from Russia. The armistice was granted on Sept. 9, and the Russian army under Marshal Fedor Tolbukhin occupied the country. The Bulgarian democratic government was dismissed. The new cabinet, formed with Russian approval, was headed by Kimon Georgiev, who had led the military coup d'état against the democratic government of N. Mushanov in May 1934, and had introduced an antiparliamentarian dictatorship.

The new "Fatherland Front" government had the full backing of soviet Russia and the leftist parties. Many persons, among them the leaders of the pro-German groups, were arrested. Though the cabinet included four communists in key positions and its policy was dominated by Russia, it was emphasized officially that no attempt would be made to introduce communism.

On Oct. 11, 1944, Bulgaria accepted the Allied armistice terms calling for the evacuation within 15 days of all Bulgarian troops and officials from the Greek and Yugoslav territories occupied by Bulgaria in 1941. A joint Allied military mission under the chairmanship of the soviet representative was established in Sofia. Foreign Minister Petko Stainov declared that the Bulgarian people wished to show the whole world, and primarily the Allies, that it was ready to wash away in its own blood (by fighting the Germans) the stain of its former criminal rulers. The armistice was officially signed in Moscow on Oct. 28. Reparations to Greece, Yugoslavia and other United Nations were left for later negotiations. Thus the country was not immediately burdened with heavy reparations such as those of Finland, Rumania and Hungary, though Greece had suffered much from Bulgarian occupa-

Communist Dominance.—The Fatherland Front government continued to strengthen its hold upon the country. Premier Kimon Georgiev, and the minister of war, Damian Veltchev, were members of the Zveno group, which changed its former fascist leanings to a strong Russophile pan-Slavism. The most influential member was the minister of the interior, Anton Yugov, a communist, who had under his control the armed militia which ruled the country. Although the Fatherland (Otechestven) Front represented officially a coalition in which the strongest democratic party in Bulgaria, the Agrarians, was represented, the most important Agrarian leaders protested against the preponderant communist influence and went into opposition. Among them were Georgi M. Dimitrov, who in May 1945 was forced to take refuge in the U.S. legation, and Nikolai Petkov, who resigned from the cabinet.

Special people's courts dealt with enemies of the regime and former collaborators. Several thousands were executed, among them the former regents, Prince Cyril, ex-premier Bogdan D. Philoff and General Nikolai Mikhov. New laws "for the defense of the people's authority" threatened the most drastic punishment for any active opposition to the Fatherland Front government. Elections were first slated for Aug. 26, 1945, but they were postponed at the last minute as the result of protests of the U.S. against the "undemocratic" procedure. The Russian press protested against this "interference" in Bulgaria's affairs.

The postponed elections were held on Nov. 18, 1945. The voters had only one list presented to them, the official list of the Fatherland Front government candidates; no opposition lists were presented. The official single list comprised 94 Communists, 94 Agrarians, 46 Zvenoists, 32 Social Democrats and 11 Radicals, in each case representing only that group which was collaborating in the government, not the opposition. Foreign Minister P. Stainov proclaimed the election results a confirmation of the Fatherland Front's attachment to Russia—"our liberator"—and to Marshal Tito's Yugoslav regime.

George Dimitrov, the communist leader and ex-president of the comintern, the most influential man in Bulgaria, denied that there was any question of a soviet Bulgaria, and even deplored the excesses committed by the government (the number of executed "war criminals" surpassed by far the 3,000 officially sentenced by the people's court, and the wives and children of "war criminals" were long kept in internment), but the promises to broaden the government and to include democratic representatives were not kept. Members of the opposition continued to be regarded as "traitors." Formerly violently antibolshevist groups, like the war minister Veltchev's Military league, became fervent pan-Slavs. Their pro-Russian attitude was partly based on hostility to Greece and Turkey and expansionist intentions against these countries, supposed to be in the "British camp."

The Moscow conference of the Big Three at the end of 1945 decided that Russia should advise Bulgaria to include in the government representatives of at least two democratic groups. The procedure in this case was different from that adopted in the case of Rumania, where representatives of all the three powers were to consult with the king about the broadening of the government. The most important democratic forces in Bulgaria were the Agrarians, headed by Nicholai Petkov, son of the great national liberal leader and brother of the prominent Agrarian Petko Petkov, who was assassinated; the Socialists under Kosta Lulchev and Kristo Pastukhov; finally the veteran democrat Nicholai Mushanov, who, probably with the Agrarian leader George Dimitrov (not to be confused with the communist leader of the same name), were the most popular Bulgarian leaders.

Premier Georgiev went to Moscow on Jan. 7, 1946, to consult with the Russian government, after negotiations with the opposition had broken down. The opposition had demanded guarantees for the liberties of Bulgarian citizens, freedom of the army from all party influences, and the holding of new general elections as soon as possible. Soviet Vice-Commissar Vishinsky visited Sofia, but the opposition leaders held fast to their demand for liberty in spite of Vishinsky's threats that "history will pass by such people and will follow its course." The Bulgarian situation reached a complete deadlock, and thus the Moscow agreement could be considered as a full diplomatic victory for the soviet union and the Russian-appointed Bulgarian government.

On Feb. 22, 1946, the U.S. government sent a memo-



Bulgarian peasant girls in native costume carried sheaves of wheat as they paraded through Sofia on May day, 1946

randum urging the Bulgarian government to find a mutually acceptable basis for inclusion of two truly representative members of the opposition parties in the cabinet. This demand by the U.S. was officially and sharply rebuked by the soviet government, which also charged that the U.S. political representative to Bulgaria, Maynard B. Barnes, was systematically encouraging the oppositional parties in that country. On March 11 U.S. Secretary of State Byrnes flatly rejected the soviet charges and expressed his surprise that the Russian government had taken exception to his expectation that the opposition leaders should enter the government on terms satisfactory to the opposition as well as the government. He regarded this expectation as "the very essence" of the Moscow pact, and a "fundamental and simple proposition." But the efforts of the U.S. were of no avail. On March 31 Bulgaria announced the formation of a new cabinet without including any opposition members, because "the soviet union considered the terms presented by the opposition for participation in the government . . . unacceptable." There were few new members in the cabinet. One of them was Deputy Premier Kostov, a communist who held also the portfolio for electrification.

The course of the new government was even more outspokenly extremist than before. On April 19 the minister of justice introduced a bill in the assembly providing for the suppression of newspapers and periodicals deemed guilty of the systematic publication of material prejudicial to the interests of the state or its relations with foreign powers. When the opposition leaders addressed a memorandum to the Allied Control commission in Sofia, submitting grievances, the government attacked the opposition "seeking foreign intervention in the internal affairs of the country," organized spontaneous mass meetings throughout the country and filled them as well as its press with gravest warnings to the opposition. The political trial against George M. Dimitrov, famous Bulgarian Agrarian leader and 17 of his followers for infringement of the state security laws began on May 29, and on June 7 a similar trial was staged against Kristo Pastukhov, the

Social Democrat leader who had been under arrest for several months.

As time went on, communist pressure upon the government became ever stronger; it was now intended to transform the coalition regime under communist leadership into an openly communist administration. The army was purged and Gen. Veltchev forced to resign as minister of war. On Sept. 8, 1946, the monarchy was abolished in a plebiscite and a people's republic created. Until the elaboration of a new constitution, the president of the Bulgarian parliament or *Sobranye*, Vasil Kolarov, a communist, was taking over the prerogatives of the crown.

On Sept. 24, 1946, Secy. Byrnes on behalf of the U.S. government demanded in a letter to the Bulgarian prime minister, the fulfilment of the agreement regarding freedom of press, radio and assembly for the opposition, noninterference of the militia with candidates or voters, release of political prisoners or open formulation of charges against them, and elimination of any possible threat of post-election retaliation for political reasons. The Bulgarian government, backed by the Russian government, rejected all these proposals for the freedom of elections as an interference with Bulgarian sovereignty.

The elections to the constituent assembly were held on Oct. 27, 1946. Of a total electorate of 4,558,332 no less than 4,244,337 voted. The government Fatherland Front received 2,983,803 votes and 364 seats. Of these votes 2,265,105 went for the Communists who received 277 seats and became the strongest party in the assembly with an absolute majority over all government and opposition parties put together. The opposition parties, Agrarians and Social Democrats, received 1,208,882 votes, the small opposition party of the Democrats received 22,755 votes. As a result a communist, Vasil Kolarov, was elected president of the assembly with 304 against 71 votes. On Nov. 21 prime minister Kimon Georgiev and his cabinet resigned and the veteran communist leader George Dimitrov formed a new government.

_	1938	
Item	Value	Amount or
Exchange rate	(000's omitted)	Number
United States		1 lev = $1.24c$ 400 levs =£1
Finance		
Government Revenues	\$89,680 (£18,343)	
Government Expenditures	\$89,360 (£18,278) \$24,926 (£5,098)	
National Debt	\$270,581 (£55,345)	
Transportation		
Railroads		2,077 mi.
Highways		18,938 mi.
Navigable Waterways (Danube)		243 mi.
Communication Telephones		29.576
Telegraph Lines		493 mi.
Radio Sets		55,000
Minerals		
Iron Ore		18,487 tons 1,924 tons
Manganese Ore		2,080 tons
Copper Ore (metal content)		71 tons
Crops		
Wheat		2,368,512 tons
Vineyards		678,686 tons 586,754 tons
Barley		391,096 tons
Exports		
Total	\$69,305 (£14,176)	551,000 tons
Leaf Tobacco	\$29,370 (£6,007) \$6,880 (£1,407)	37,000 ,, 63,000 ,,
Eggs	\$5,425 (£1,110)	17,000 ,,
Wheat	\$4,481 (£917)	121,000 "
Imports		
Total	\$61,302 (£12,539) \$7,164 (£1,465)	421,000 ,, 9,000
Machinery and Parts	\$3.608 (£738)	13,000 ,,
Cotton Thread and Cloth	\$3,285 (£672)	3,000 "
Wool and Wool Thread	\$3,265 (£668)	3,000 "
Defense		F1 /10
Standing Army Personnel Standing Air Force Personnel		51,610 1.610
Military Expenditures	\$22,619 (£4,627)	1,010
Education		
Schools		7,782
Teachers		30,832 1,086,849
Students		1,000,047

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Bulgarian Literature

See CENTRAL EUROPEAN AND BALKAN LITERATURE.

Buna Rubbers

See CHEMISTRY; RUBBER.

Bureau of Standards, National

See STANDARDS, NATIONAL BUREAU OF.

Burma

Burma, a British dependency, is a long narrow strip of land, mostly tropical, lying between lat. 9° and 28° and long. 92° and 101°, on the western edge of the Indo-Chinese subcontinent. Burma is bounded on the north by Tibet, the east by China, French Indo-China and Siam (Thailand), and on the northwest by Bengal and Assam. Area, 261,600 sq.mi.; the pop. in 1941 was 16,823,798. Rangoon (pop. 1941, 501,291) on the Hlaing river, a nodal point in internal communications with good waterways to the Irrawaddy and good land connections north and south, is at once the biggest seaport, the largest trading centre and the capital city. Other main ports are Moulmein (pop. 1931, 65,506), Bassein (pop. 1941, about 50,000) and Akyab (pop. 1931, 38,094). These, with Mandalay, the old capital of Upper Burma (pop. 1941, 163,537), are the only towns with more than 30,000 people.

Racially. the peoples of Burma are Mongoloid. About 90% are Buddhist by religion, and about 70% use the Burmese language. The largest indigenous minorities are: (1) the Karens, who live in the southeastern hills, but have large colonies all over Lower Burma; in 1931 they num-

bered 1,367,673, of whom more than 1,000,000 were Buddhists and 218,790 Christians; (2) the Shans, who spread in gradually thinning numbers from the Shan States in the east and southeast toward the west and north; in 1931 they numbered 1,057,406; (3) the Chin-Kachin group in the horseshoe of hills round the north who include also Nagas and some other tribes, totalling by 1946 about 750,000.

The largest immigrant minority was the Indian population numbering 1,017,825 in 1931, divided equally between Moslems and Hindus, with a sprinkling of Sikhs, Christians and others. The Chinese in 1931 numbered 193,594, but by 1942 may well have doubled in numbers. Europeans, Anglo-Burmans, etc. (including the British regiments), totalled 30,851. Japanese at no time exceeded a few hundreds. Governors during the decade 1937–46: Sir Archibald Cochrane 1936–41; Sir Reginald Dorman-Smith 1941–46; Sir Hubert Rance thereafter. Premiers: Dr. Ba Maw 1937–39; U Pu 1939–40; U Saw 1940–42; Sir Paw Tun 1942 (Jan. to evacuation).

Separation from India.-As a province of India, Burma, from Dec. 1922, had shared in the "Montford" scheme of dyarchy. By the Government of Burma act, 1935, passed by parliament in London, which came into force on April 1, 1937, it was separated from India and endowed with a new constitution, having a ministry and a bicameral legislature, a house of representatives with 132 members elected on a wide franchise and a senate of 36, half elected by the lower house and half nominated by the governor. Effective power vested in the lower house, the functions of the senate being circumscribed. The authority of the ministers covered a wide field, the only major reservations being defense, foreign affairs and control of currency. The state railways were managed by a board of experts and nonofficials. In their own sphere, the ministers were responsible to the legislature, the governor being bound by his instrument of instructions to accept their advice on all normal occasions. The "reserved" subjects were administered by nominated counsellors, but joint consultation between them and the ministers was, under his instrument of instructions, to be encouraged by the governor. This was given practical effect in the defense sphere by the establishment in 1939 of a joint defense council, which assumed considerable importance in the 1942 campaign. The act also provided for the appointment by the governor of a financial adviser. Finance, however, was in general under the finance minister, who presented estimates to the lower house. Estimates for reserved departments, though not votable, were discussed in both houses. The premier and his colleagues acted as a cabinet, and the doctrine of joint responsibility was adopted. Except on rare occasions, the governor did not attend cabinet meetings, which were normally presided over by the premier.

The act also contained safeguards against discrimination for minorities, for certain classes of government servants, and certain non-Burmese commercial interests. Separate administration for the Shan States and the hill tracts was provided.

Internal Politics, 1937–42.—A general election in Dec. 1936 preceded the new constitution. It produced a somewhat fragmentary house containing no fewer than seven parties and six groups with the "no party" label. U Ba Pe, leader of the United party (46 members) was unable to form a ministry, and Dr. Ba Maw, leader of the Sinyetha (Poor Man's) party of 14 members formed a coalition, principally with the minorities, and took office as first

premier of Burma. All parties, with the exception of the three Thakin (Master) party members, showed a genuine, if fluctuating, desire to work the new constitution and raise the status of Burma. All had much the same aims, and divisions among them were based on personal loyalties rather than policy. Ba Maw's program was one of rural land reform, increased social services, retrenchment, reduction of taxes and full self-government or independence for Burma. His first measure was the abolition by stages of capitation tax in Lower and Thathameda (Household) tax in Upper Burma. This relieved the labouring classes of all direct taxation, but cut the revenue by some 6%. A new source of revenue was found in state lotteries, and these made up part of the loss. Measures to regulate rural tenancies and the holding of land were put in train, and a committee known as the fiscal committee was appointed to examine government revenue and expenditure. The Tenancy act and other ameliorative measures fructified under Ba Maw's successors, and promised well for the future when interrupted by the Japanese invasion. The fiscal committee's report was adopted by a later ministry but had not been put fully into effect before the evacuation. Some of its recommendations were controversial; others lost validity in the postwar economy.

In the summer of 1938, however, progress was interrupted by anti-Moslem riots which broke out in Rangoon over a trivial cause and spread, sedulously fanned by propaganda, over most of the country. The disturbances lasted for many months and caused heavy loss of life and property. During the same period there was a growth of general unrest, manifesting itself in labour troubles and school strikes. These were for the most part inspired and led by the Thakins. Their creed was advanced socialism or communism coupled with an exclusive nationalism, but their program was vague and as yet their influence was small.

Its failure to maintain order cost Ba Maw's ministry the support of the minorities. In Feb. 1939 it fell, and was succeeded by a United party ministry under U Pu. A new competitor, however, had appeared. In 1938, U Saw founded the Myochit (Patriot) party, while still remaining a member of the U Pu ministry. In Sept. 1940 he broke away, and thereby caused U Pu to be defeated in the house. U Saw then took office as premier, an office he continued to hold till Jan. 1942.

The outbreak of war in 1939 had little effect on Burma, which looked forward as in 1914 to an increasing demand at rising prices for its products. In Feb. 1940 the house of representatives passed a resolution condemning German aggression, but making support for the war effort conditional on the grant of dominion status. In practice there was no refusal of co-operation: Burma's contribution at this stage was merely to increase the supply of its products, to which good prices were adequate encouragement. Defense, a "reserved" subject, seemed at first to have little bearing on the European military situation to which apparently Burma could best contribute by moderating its own demands for instructors and equipment. Other issues absorbed the public interest, two of which drew sharp attention to the new status of Burma in international affairs.

Relations with India.—For some years, particularly since the riots of 1938-39, Indo-Burma relations had been a constant source of worry to both governments. Protracted discussions finally led to the arrival in Rangoon at the end of 1941 of a representative of the government of India to negotiate an immigration agreement. An agreement was reached with U Saw's ministry but was so unfavourably received by the press and public in India that it was never ratified. Feeling ran high in both countries, and nothing more could be done before the evacuation. Discussions were resumed by the exiled government of Burma in India and a fresh agreement was drafted in 1945. This was not too well received by the public in India, and when laid before the governor's council in Rangoon was seen to be unacceptable in Burma. Ad hoc arrangements were made for the return of certain classes of evacuee, but otherwise no progress was recorded.

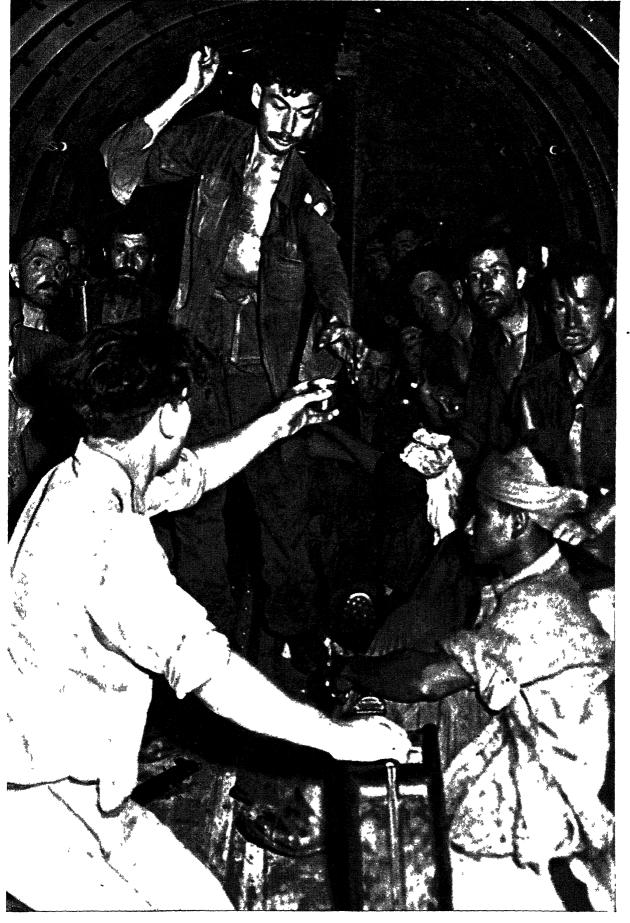
Opening of the Burma Road.—The other important factor was the opening of the road to China. Many elements in Burma had opposed it as likely to lead to a Japanese air attack on Rangoon, while opening the door to an influx of Chinese immigrants. The Chinese government, however, was anxious, and the British and United States governments were solicitous. By 1938 the road was built, and soon from Rangoon to Lashio the towns were thronged with Chinese contractors and traders, officials and nonofficials, buying stores and transport for China. The negotiations on Indian immigration had attracted the attention of the Chinese government, which made known its desire to negotiate an agreement, and appointed a delegation, of which the head was given the rank of ambassador, to proceed to Rangoon for discussions. To facilitate negotiations, the Burmese representatives were appointed by the secretary of state to be his agents, which gave them much wider powers. The discussions, however, came to nothing. After one meeting they were suspended till U Saw should return from the United Kingdom, and the Chinese delegates for their part could receive further instructions. The course of the war with Japan prevented the negotiations from being resumed, but its relations with China remained an important factor in Burma's foreign policy.

Threat of War.—Meanwhile, in 1940, the fall of France had brought the Japanese menace much closer, and attack seemed imminent. Contrary to expectation it did not come, though at one point it was staved off only by closing the road to China. Recruitment for the army was pressed on, and small volunteer naval and air forces were established. Conscription was introduced for Europeans and the courses founded for them were thrown open to Burmese volunteers. Civil defense measures were started and arrangements drafted to put the country on a war footing. With scarcely an exception, all parties, creeds and races united in preparing for war.

U Saw, however, had not given up the idea of dominion status, and in 1941 he went to London to make a personal appeal. But the time was unfortunate; the British government had too many other things on its mind to give close attention to Burma's problems, which seemed remote from the war, and his mission was abortive.

U Saw did not return. While he was on his way back, the Japanese attack began, and on his journey he was arrested and interned by the British government for contacting the Japanese. He was released only after the war and returned to Burma early in 1946. His arrest caused hardly a ripple on the surface of Burmese politics. He was succeeded by Sir Paw Tun, who remained in office till the evacuation, when he proceeded to India as one

Wounded and suffering from thirst and dysentery, raiders of a British jungle penetration force are shown inside an R.A.F. rescue plane which picked them up behind Japanese lines in northern Burma in April 1943, and returned them to safety





Chinese troops passing through Maingkwan, Burma, in the Hukawng of the advisers to the governor. In 1945 he returned to Maingkwan on March 4, 1944

hold the portfolio of home affairs in the governor's council.

Japanese Invasion.—On Dec. 9, 1941, the Japanese occu-

pied Victoria Point unopposed. The main attack, however, did not open till Dec. 23 and 25, when there were heavy air raids of considerable accuracy on Rangoon. A land invasion from Siam threatened Moulmein and Tavoy. The defenders were unable to hold the Japanese advance, and then began that fighting retreat that ended only in May 1942, when the army finally withdrew to India, hampered at every move by the presence on the routes of thousands of refugees. The campaign was marked by much heroism among both soldiers and civilians on that long march. In the air, the force of the Japanese air attack on Rangoon was broken by the spectacular gallantry of the U.S. air volunteer guard (sent by Generalissimo Chiang Kai-shek) and the devotion of the R.A.F. fighters. For the first time also, Chinese land forces, under a U.S. army commander, fought side by side with the British against a common foe.

The regular campaign was soon over, but in the hills the Japanese could never establish themselves, and resistance went on, persistently and successfully, till the reoccupation in 1945.

In May 1942 the government of Burma went into exile in India, where it spent the next three years in planning against the day of return. Thus for the time being ended a great experiment in constitutional development.

Burma under the Japanese.—It was the policy of the Japanese to make Burma into a puppet state in subordinate alliance with Japan, and for this they required an instrument. Some 30 young Thakins, of whom Aung San was the most important, had left Burma secretly in 1941 and contacted the Japanese, with whom they returned at the time of the invasion, acting as guides, interpreters, etc. The initial successes of the Japanese encouraged many to join them; some 3,000 irregulars assisted the Japanese in the fighting. As each district was occupied, the Thakins endeavoured to set up an administration, but their incapacity and the excesses of their followers embarrassed the Japanese and alienated their own people.

Presently the Japanese found it necessary to disband their forces and reform them under closer discipline with Thakin Aung San as major general in command, under the title Burma National army. In the political sphere, Ba Maw, who had been convicted and imprisoned for sedition in 1941 but escaped in the confusion of the evacuation, put himself forward as head of the state, and was gratefully accepted by the Japanese. He recalled government servants to their posts, and restored some semblance of administration. With the agreement of the Japanese, he invited a number of ex-ministers and other public men to join an independence preparatory commission to draft a new constitution.

The climax came when on Aug. 1, 1943, Burma was formally declared independent with much pomp and circumstance, and the new constitution (which bore many resemblances to the old one) was introduced. On the same day, Ba Maw declared war on the Allies, a declaration which was put into effect in varying degrees by the members of his administration. Simultaneously, he signed a pact of alliance with Japan. Envoys were sent to Japan and other countries in the "co-prosperity sphere" and there was much coming and going between Rangoon and Tokyo. Japanese became the second language of the country, and students and officer cadets were taken to Japan for training. Many of these were the sons of prominent men and were as much hostages as pupils. The declaration of independence had a profound effect on the country, and brought many waverers over to the side of the Japanese.

Disillusion; Welcome to Allies.—Burma, however, was cut off from world markets, and Japan could neither buy its surplus produce nor supply its needs. Shortage of supplies and transport, and a new and plentiful paper currency fostered inflation. Black markets and other rackets flourished, but genuine credit almost dried up altogether. Much land went out of cultivation, and except for the lucky speculators the country sank into sullen apathy. The Japanese army of occupation paid scant

attention to the Burmese government's officials, and labourers, draught-animals and supplies were arbitrarily seized and carried off at the will of military commanders. Ba Maw, who had amalgamated the Thakin party with his own, fulfilled the dual role of party chief and head of the state. More and more, he and his family began to assume semi-royal prerogatives. Disillusion set in, and life dragged on in this uneasy atmosphere until in 1945 the Allies swept down to Rangoon. The Japanese, thrown back in confusion everywhere in the far east, could resist no longer. The victory was complete, but the cost to the country was enormous. Ba Maw fled with the Japanese and ultimately gave himself up in Tokyo in Jan. 1946. He was permitted to return to Burma in August. Not only its physical assets, but also its whole social and economic life had been destroyed. Yet there was no country where a warmer welcome was extended to the advancing Allies.

Reconstruction.—This situation presented the British government with a problem. Help immediately, and continued assistance for some years would be needed to set Burma on its feet again. Moreover, a solution had to be planned in advance, before Burmese opinion could be consulted. The plan adopted was published in a White Paper in May 1945. It provided for three stages: (1) A period of direct rule by the governor with a nominated council and legislature; (2) A return to the 1935 act once a new franchise could be settled and an election held; (3) Complete self-government within the commonwealth.

An early advance to stage (2) was foreshadowed when in July 1946 the Burma Legislature act became law. This

granted the franchise to all men and women over 21, lowered the ages for membership off the upper and lower houses to 30 and 21, and abolished the property qualification for senators. The first election was envisaged for the spring of 1947. Advance to stage (3) "at the earliest practicable moment" was forecast in the governor's inaugural address in Sept. 1946.

For five and a half months after the occupation of Rangoon, the military administration had continued in charge of affairs but on Oct. 16 the governor resumed control. Political discussions were begun at once, but the political climate had changed. The first raptures of liberation from the Japanese had passed and party leaders had begun to consider their future. The Thakin party, as it had been the first to welcome the Japanese, had also been the first to see through them, and the Burma national army had been in touch with the British forces for some time before it joined them

openly in March-April 1945. It was the first purely Burmese force to take the field after the days of the Burmese kings, and Major General Aung San became a national hero. This gave the party great ascendancy, and its first aim was to form a national front under the title Anti-Fascist People's Freedom league, in which it would be the dominant partner. All parties had accepted the White Paper in principle, but discussions with the A.F.P.F.L. on participation in the governor's reconstruction administration broke down as they claimed too dominant a share. They then withdrew from the discussions, and the governor formed a council of 11, of whom 10 were Burmese who either had not joined the A.F.P.F.L. or withdrew from it. A little later, the A.F.P.F.L. was invited to co-operate in the legislature, but these discussions also failed. In the summer of 1946, U Saw's Myochit party revived, and its leader forced the resignation of two of its three representatives on the governor's council. Desultory discussions continued for the reconstitution of the council, and in September the advent of a new governor gave the required opportunity for a fresh start. The time in other respects was not auspicious, as the Rangoon city police had just gone on strike for increased allowances, and the police elsewhere and some other government servants began to follow their example, with the open support of the A.F.P.F.L. After tedious negotiations, the governor's council was reformed, with A.F.P.F.L. holding most of the portfolios, and its leader U Aung San as a counsellor to the governor, and vice-president of the execu-

	Burma- Stati	istical Data		
	193	38	194	10
ltem	Value (000's omitted)	* Amount or Number	Value (000's omitted)	Amount or Number
Exchange rate		1 Indian Rupee = 1s 6d. (36.59c)		1 Indian Rupee = 1s.6d. (30.15c)
Finance Government Revenues Government Expenditures National Debt	£11,492 (\$56,183)	13 04. (00.074)	£13,496 (\$51,689) £12,343 (\$47,272)	13300. (50.1704)
Transportation Railroads		2,667 mi. 10,530 mi. 1,682 mi.		
Minerals Petroleum Lead Tungsten (concentrates) Tin Zinc (concentrates)		7,538,000 bbl 88,367 tons 6,982 tons 4,941 tons 67,984 tons		
Crops Rice	٠	7,418,021 tons 185,208 tons 66,855 tons 60,038 tons		
Livestock Cattle		5,162,517 1,017,805 519,789		
Forest Products Teak		317,920 tons		
Exports Total Rice Kerosene Teak Lead	£37,367 (\$182,689) £15,354 (\$75,064) £5,331 (\$26,063) £2,607 (\$12,748) £2,059 (\$10,065)	3,110,000 tons 157,731,000 gal. 107,931,000 bd.ft. 87,000 tons	£42,550 (\$162,967) £18,977 (\$72,680) £5,990 (\$22,942) £2,450 (\$9,382) £1,986 (\$7,606)	3,415,000 tons 168,708,000 gal. 213,795,000 bd.ft. 88,000 tons
Imports	£17,823 (\$87,139) £2,908 (\$14,219) £1,098 (\$5,367) £1,034 (\$5,055) £896 (\$4,380)	170,252,000 yd. 68,000 tons 52,459,000	£19,810 (\$75,871) £1,978 (\$7,574) £1,223 (\$4,685) £1,066 (\$4,082) £1,419 (\$5,433)	178,497,000 yd. 83,000 tons 52,162,000
Education Primary Schools Enrolment Middle and High Schools Enrolment Special Schools Enrolment Unrecognized Institutions University Enrolment University Enrolment (reliable data not available.)		5,125 330,056 1,370 217,494 1,143 18,366 18,436 212,975 1 2,121		5,679 384,060 1,417 233,543 1,173 19,291 18,745 212,663 1,2,365

tive council. The new council was given wider powers than its predecessor, and entered on its duties at the end of September, its first task being to try to put an end to the strike. On the military side, an agreement made by Admiral Mountbatten with the A.F.P.F.L. at Kandy in Sept. 1945 provided for incorporating the Burma national army (now styled the Patriot Burmese forces) in the Burma land forces. Thakin Aung San preferred to revert to civil life, and his second in command took his place on the staff of the Burma command.

In the economic field, the governor ordered special measures to encourage the cultivation of rice, which had fallen to some 50%-60% of prewar figures, and these added some 2,000,000 ac. to the area plowed in 1946. Rail, road and river transport, power plant and consumer goods were ordered in pursuance of the plans made in India. For each major industry there was formed a board of experts, officials and members of the public, to operate as government agents with funds supplied in part by the British treasury and in part by the concerned interests.

The social services were re-established by the military administration and in 1946 were being expanded as funds and staff became available. Many students were sent abroad for training after the liberation.

The cost of all these measures greatly exceeded Burma's resources, and the British government put at its disposal some £87,500,000, on terms to be settled later.

Separate Position of Hill Areas.—The hill areas presented a problem entirely different from that of the rest of Burma. Chins, Kachins and Karens showed inveterate hostility to the Japanese and their satellites, and suffered, often at the hands of the latter, for their loyalty to the Allied cause. Feeling in some areas ran high after liberation, and there was even talk of complete secession, particularly among a section of the Karens, who sent a deputation to London on the subject in the summer of 1946.

For the hill peoples in general, however, including the Shan states, who live in the non-Burmese areas excluded from the scope of the elected government, a separate program was inaugurated to help them rise culturally and politically nearer the level of the Burmese; when they had reached that level, they could, if they so desired, join up with one another and with self-governing Burma in the plains. The hills and the plains, economically interdependent, sooner or later were likely to form one political whole. (See also Japan; World War II.)

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(R. M. MACD.)

Burma Road

See BURMA; ROADS AND HIGHWAYS.

Burton, Harold Hitz

Burton (1888—), U.S. jurist, was born in Jamaica Plain, Mass., June 22, 1888. Graduated from Bowdoin college, Brunswick, Me., 1909, and from Harvard university law school (1912), he practised law in Cleveland, O. He joined the U.S. army in World War I, serving on the western front. On returning to civilian life, he resumed his practice; he also served as an instructor in corporation law at Western Reserve university law school. In 1929, he was elected to Ohio's house of representatives and concurrently served as director of law for the city of Cleveland (1929—

32). Running as an Independent Republican candidate, Burton was elected mayor of Cleveland in 1935 by a large majority. Five years later (1940) he was elected U.S. senator for Ohio on the Republican ticket. In March 1943 Sen. Burton, together with Senators Joseph H. Ball, Carl A. Hatch and Lister Hill, sponsored the famous "B2-H2" resolution, which called for U.S. leadership and participation in forming a world organization of nations. At the same time, Burton urged elimination of the senate's two-thirds majority rule required for treaty approval. In the senate, Burton generally endorsed the Roosevelt administration's foreign policy but followed, with few deviations, the Republican program on domestic issues. On Sept. 18, 1945, Pres. Truman named Burton as an associate justice of the U.S. supreme court.

Buses

See Automobile Industry; Electric Transportation; Motor Transportation.

Bush, Vannevar

Bush (1890-), U.S. scientist, was born March 11, 1890, at Everett, Mass. He received his doctorate in engineering at Massachusetts Institute of Technology and Harvard in 1916. In World War I, he conducted research on behalf of the U.S. navy in submarine detection. Associate professor and later professor at M.I.T., he was vice-president and dean of engineering at that school, 1932-38. In 1939 he was named president of the Carnegie Institution of Washington. While at M.I.T., he built the famous mathematical robot, later used by the U.S. army to solve gunnery problems. In June 1940 President Roosevelt named Bush chairman of the National Defense Research committee, a scientific research group charged with coordinating all experimental investigation to speed up national defense. In June 1941 President Roosevelt created the new Office of Scientific Research and Development with Bush as its director. In Aug. 1943 in order to expedite development of the atomic bomb, Bush was named to a combined policy committee that included Canadian and British government officials as well as U.S. members.

On Jan. 7, 1946, Secretary of State James Byrnes named Bush to a special five-man committee to study what controls and safeguards would be required to protect the U.S. from atomic warfare. He was named chairman July 3, 1946, of the Joint Research and Development board, set up by the war and navy departments to carry out a unified research and development program for national defense.

Business Review

The period from 1937-46 in the United States may be divided roughly into four phases: peace, defense, war, reconversion. The dividing point between these phases is difficult to determine, as one overlapped the other to some extent in every case. Germany invaded Poland in Sept. 1939; it was a short time after that when the reality of war struck home to the people of the U.S. and when business began to feel its effects. For the sake of convenience, the dividing point between peace and defense can be placed at the end of the year 1939. The defense period may be said to have ended Dec. 7, 1941, with the attack on Pearl Harbor. Hence, the year 1941 must be considered a defense year as far as the economy of the U.S. is concerned. The reconversion phase started in a small way about the middle of 1944, when confidence was widespread that Germany would collapse at any time and that Japan, though it might hold out a long time, would not constitute a serious drain on the economy. During the rest of

1944, however, the public became convinced that the war was not yet won, and that it was necessary to continue the war spirit until it was really over. Germany gave up in May of 1945 and Japan in August; reconversion made a start on V-E day and was given the "all clear" on V-J day.

The Four Phases.—Thus the four periods of the economy of the U.S. during the decade 1937–46 are blocked out: 1937–39, peace; 1940–41, defense; 1942 to the middle of 1945, war; after mid-1945, reconversion.

Peace, 1937-39.—During the peace phase of the decade the attention of U.S. business men was focussed on three major items: the New Deal policies of the federal government, the depression of 1938 and the prospects of war in Europe.

The New Deal in its most revolutionary phases had passed, the National Industrial Recovery act had been declared unconstitutional, and with its passing went the elaborate machinery of its operations. Many of the more conservative of the New Deal measures withstood the test of constitutionality and by 1937 were accepted by business as part of the economic order. Such things as Social Security and the Securities Exchange commission were not only generally accepted but believed to be wholesome additions to the economic structure. At least those who had previously assailed them most vigorously had, by now, grown weary of complaining.

Relations between business and government were nevertheless not happy. There was a mutual feeling of distrust which was heightened by Pres. Roosevelt's plan to "pack" the U.S. supreme court in the early part of 1937. Business lived in fear of the government, but the government insisted that business did not do so. The government published figures of 50 "representative" manufacturers showing their inventories higher than in 1929. This, the government contended, was proof that business did not live in fear. Business economists, however, generally held that 1937 was not a year characterized by large inventories. It was'in 1937 that the first undistributed profits tax was paid. This tax was widely criticized on the grounds that (1) it would induce business to pay out the profits and borrow to finance its expansion instead of expanding by the timehonoured method of retaining earnings and (2) a loss in one year could not be recouped in a good year without paying a penalty—a particularly stiff penalty on those companies with extreme business cycles as compared to those with a greater stability throughout the cycle.

The electric power industry had two worries peculiarly its own. One was the fear of government competition. The Tennessee Valley authority was coming into full operation, and the utility companies feared that the plan might be carried to other regions. There was also uneasiness caused by the Public Utility Holding Company act, which contained the "death sentence" on the large and complicated public utility holding company financial structures.

Business was also harassed by labour during this period. It was in the first part of 1937 that the sit-down strike started in the General Motors plants. By this method, labour forced the company to commit the first act of violence. Court injunctions were granted enjoining labour from occupying the plant on the principle of private property rights, but the injunctions were ignored. It was in the same year that the big steel and the west coast shipping strikes occurred. In 1938 the Fair Labor Standards act was passed, setting maximum hours, and minimum wages, prohibiting child labour and forcing employers to bargain collectively with the recognized labour union of the plant.

The Agricultural Adjustment Act of 1938 was designed

to aid the farmers through a soil conservation program, loans, marketing quotas, parity payments, marketing agreements, crop insurance and diversion of surpluses. At this time the farmers found themselves in a sorry plight. Their income was 13% lower than in 1937, and the prices of farm products fell on the slightest provocation. On the other hand, the prices of the manufactured products which they bought were held firm by the ability of manufacturers to control supplies. There were but three immediate possibilities of relief open to the farmer: lower prices on manufactured goods, devaluation of the dollar and a boost in farm prices through the new Agricultural Adjustment act and other crop controls.

The Guaranty Survey in its summary of 1937 listed three major economic problems that called for solution. One was the development of a long-range plan for relief expenditures in time of stress. The second was the fiscal problem including a balanced budget, a broadened tax base and a reduction in the federal debt. The third was the necessity for some new approach to industrial problems that would enable government, business men and labour to consider their differences in a spirit of co-operation. These same problems remained as the fundamental economic problems until they were replaced by those of a war economy about 1940.

The seasonally adjusted index of industrial production prepared by the Federal Reserve board stood at 116 in Jan. of 1937. It rose slightly during the spring and summer, but by September it had slipped back from the 120 in July to 115. From this point it fell rapidly to 107 in October, 96 in November, 87 in December and then edged down to 81 in May and June of 1938. It then began a slow uphill climb, reaching 101 in Dec. 1938. After a slight dip in the spring it rose to 106 in August. With Hitler's march into Poland it advanced rapidly and reached 124 by the end of the year.

The stock market declined in Aug. 1937, but this was regarded as a healthy sign after the long upswing. There was no sign that the long postponed consumption needs of the nation had been met. The decline in business activity consequently was considered merely a readjustment. By the end of 1937, however, unemployment was increasing by leaps and bounds. Pres. Roosevelt, in his opening message to a special session of congress, recognized the seriousness of the situation and emphasized the need for encouraging private enterprise and for a balanced budget. The commentators at the year's end predicted a gloomy future and had many suggestions as to the cause of the depression. As pointed out above, some said it was caused by overconfidence and excess inventories. Others pointed to the lack of confidence caused by the labour situation. Still others attributed the lack of confidence to the element of uncertainty created by the enormous spending of public funds. Whatever the cause, the revival did not start until July 1938. After that, it was a long, slow climb, and business did not reach the level at which it started in 1937 until after Hitler invaded Poland.

Before the depression of 1938 had reached its nadir, the strained international situation and the vague fears of war felt in 1937, had turned into real apprehension. It was in March 1938 that Hitler's war-of-nerves on Austria reached its climax with the *Anschluss*. That was followed by the "Munich pact" of Sept. 1938, which was presumed to have brought peace; but in December it was announced that the U.S. government was considering a huge preparedness program. War scares in March, April and Aug. 1939 were

followed by Hitler's march into Poland in September. The short Polish campaign was followed by a lull in military activities in Europe, and a number of peace gestures were made by Hitler. By the end of 1939, people everywhere were lulling themselves into tranquility by the false belief that the war was about over, that it was a "phony war." Military preparations in the U.S. seemed to reflect this attitude.

Defense, 1940-41.—The transition from peace to defense was a gradual one, from a rather uneven start. With Hitler's march into Poland in Sept. 1939 business men began furiously to prepare for large war orders by buying materials from one another, each hoping to have an adequate inventory when the orders came in. This additional demand spurred production, and by the end of 1939 the Federal Reserve Index of Industrial Production was at 124. But the anticipated war orders did not materialize, and the export business did not grow as expected. By March the index of industrial production had slipped back to 114. This was in the period of the so-called "phony" war when Hitler was proclaiming his desire for peace. In April 1940 his forces marched into Denmark and Norway. Immediately, the index of industrial production began to rise. By July 1 France had fallen, the war orders were pouring in and the index was up to 130. By the end of 1940 it had climbed to 140 and by the end of 1942 it was at 176. This rise was interrupted only by the soft coal strike in April 1941 when the index dropped back three points instead of forging ahead at its usual rate of three or four points per month. By May, however, it was back on the trend line after having risen 11 points from April, but this by no means made up for the production lost in that one month.

Business became active with war orders, but the activity was spotty, as most of the orders were given to the large, well-known suppliers. Those giving the orders were a bit fearful of their own reputations; if they gave to a small supplier and he failed to fulfil the contract, the officer who placed the order might very well be subject to criticism, but if a large supplier was not able to make good on his contract, the officer would hardly be accused of inefficiency. As a result, large suppliers were booked to capacity and often choked with more orders than they could handle. On the other hand, the small units in the industry were frequently looking for work. Many of them were engaged in absorbing the civilian customers of the large producers, but it took time to build up the channels of distribution. Business men remembered their situation during and after World War I and were fearful of again being labelled "war mongers" and "profiteers." They might have refused to take these war orders, as the U.S. was not yet at war, but they did not. Instead, business took practically all the orders it could handle and turned out the goods at what were generally considered at the time to have been fair

The aircraft industry was young and not geared for volume production. The big companies, such as General Motors and Ford, which did understand volume production, were not trained in the manufacture of aircraft and did not have the facilities for production. Some of them even started tooling up for production on their own money before the contracts were ready. In other industries much the same was true. For example, Republic Steel started an expansion program with the company's own money before it had received any great volume of military orders. Later its president turned to Consolidated

Vultee Aircraft and helped that company become a large volume producer. In this stage of war production, much of the effort had to be devoted to building the factories, producing the machine tools, building an efficient operating organization and locating sources of supply. The machine-tool industry proved to be one of the major bottle-necks.

The steel industry was caught in an unhappy predicament in 1940. At the first of the year business had been at low ebb, and the supplies of ore that had been brought to the mills during the Great Lakes shipping season proved to be inadequate. As a result the industry was caught with short ore supplies during the following winter. When the plants were built and ready to begin turning out the actual combat materials about the end of 1941, the shortages of materials became critical.

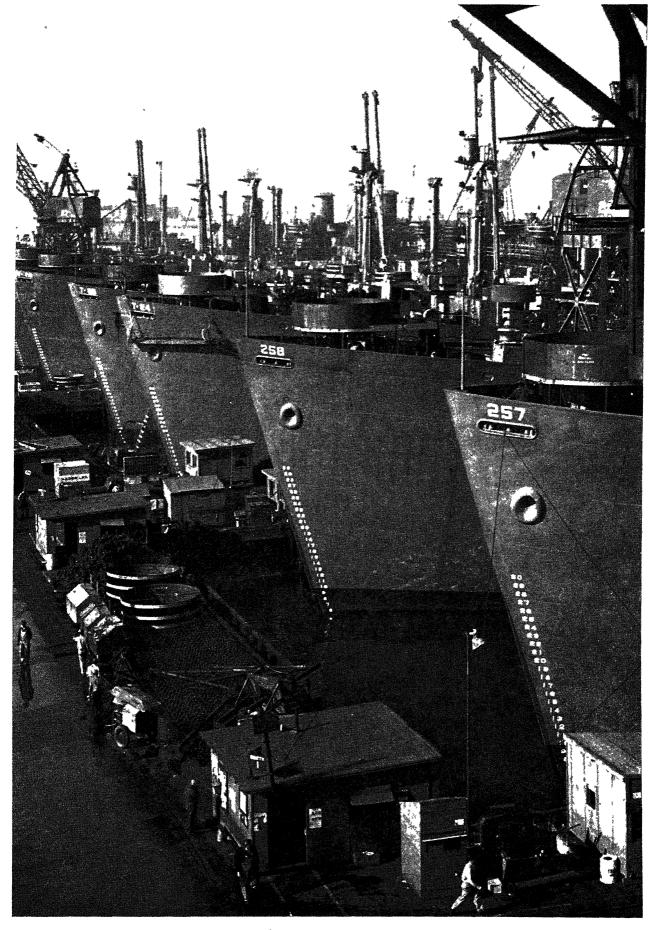
The railroads had been having a hard time after 1929, and had not been purchasing much new equipment; as a consequence, the equipment makers turned their spare capacity to the production of heavy tanks and other such military equipment. By the time the railroads felt the pinch and needed new equipment, they were unable to get it in adequate volume. Nevertheless, through efficient handling of equipment—shorter loading and unloading time, the use of more freight trains, car pooling—the railroads were able to care for all wartime demands.

With this large defense program on their hands, business men ceased arguing about New Dealism, forgot the depressions of 1932 and 1938, and pitched in to the job of production. Nevertheless, they did not feel secure. The shift of business control away from business to the federal government gave cause for concern. Though the government was not actually dictating policies it was in control by virtue of being practically the sole customer of many businesses. In others it was dictating what materials might be purchased and how they might be used. Pres. Roosevelt's statement that he "would speed all aid to Britain by eliminating the silly-fool dollar sign from the transaction" also gave cause for concern. The Lend-Lease act in 1941 and the all-aid-short-of-war policy frightened many who had hoped that somehow the U.S. might escape actual participation.

During this period business achieved none of the objectives it had hoped to achieve. Taxes were raised instead of lowered. Government spending increased. Interest rates were low. The government regulation of "don't's" turned into the positive control of "do's." All of this made business cautious. It took the war contracts at what it considered a fair price, but it was careful to see that the prices were adequate. Profits, instead of being distributed in dividends, were used to buy additional plants and to retire debt. Business men lost confidence, and business plunged to levels not known since 1935. The Dow-Jones average of 30 industrial stocks stood at 155.92 in Sept. 1939, started down in November and continued to decline, with some interruption in late 1940, to the end of this defense period when, for the month of Dec. 1941 the average daily figure was 111.

During the early part of the defense period there were many unusual factors. Unemployment ceased to be considered a serious problem. In fact, many industries were handicapped by a shortage of labour. Yet there remained 8,000,000 unemployed and the Work Projects administration and other relief rolls had not been cleaned out. The

Line-up of Liberty cargo ships completed at a California shipyard in 1943. Shipbuilding and aircraft production accounted in large measure for phenomenal business expansion on the U.S. Pacific coast during the decade 1937—46



draft law was also taking many of the workers, actual and potential. Agriculture was likewise in an unusual situation. Its prosperity depended to a considerable extent upon exports. Before the lend-lease program was under way there was practically no export market for agricultural products. Farm surpluses were high. Yet farm prices were high and so was farm income—all without extensive government aid. The whole prosperity was based on the production boom and the money it placed in workers' pockets. There was also a capital goods boom in the U.S.—the building and equipping of the defense plants. Yet the boom was not financed by private investment as had been customary. It was almost wholly financed by the government. The U.S. supplied much of the capital, but many plants were financed by foreign governments.

By the end of the period of defense everyone was feeling the effect of the program. There was some frictional unemployment and there were shortages, but in many cases there was unparalleled prosperity. These shortages were in themselves cause for concern, particularly with the large amount of money in the hands of consumers. Prices might have gotten out of hand had not rationing of certain commodities—sugar in 1942 was first on the consumer's list—begun before this could happen.

War, 1942-45.—With the transition from defense to war following the Pearl Harbor disaster of Dec. 7, 1941, there was little abrupt change in the economy. The same trends continued toward larger and larger production of war material and toward more and more governmental control over every phase of the economic life of the nation. The Federal Reserve Index of Industrial Production, which had stood at 176 in Dec. 1941, had climbed to 225 by Dec. 1942 and on to 247 in Oct. and Nov. of 1943. After that it declined gradually until it stood at 232 in Dec. 1944 and 225 when victory came in Europe in May 1945. The production miracles of 1940 and 1941 were overshadowed by still greater miracles. Production in 1943 and 1944 was about double that of 1939, and early in 1945 it was at an even higher level. Steel capacity had increased 15%. This was an industry that had operated at half capacity or less in six of the ten years preceding the war. It was the same story over and over; a great part of the increased production was provided by a fuller utilization of resources than had ever before been realized. Many plants that did not operate 24 hr. a day in normal times began to operate on such schedules. In many organizations, labour's work week increased from 40 hr., above which the pay rate was 50% greater than for the first 40, to 48, 52 and even 60 hr. per week. Through this production miracle it was possible to provide the huge amount of material needed in waging the war plus a production for other consumption that was greater than the amount available in 1939. These measurements are in terms of dollars, and therefore, to the extent that the price level rose, the consumers had fewer goods and services than would otherwise be indicated. The rise in the price level, however, was hardly great enough to negate completely the consumers' improvement in position. Moreover, in addition to the consumption of current production, there was also much consumption out of inventory.

For several years before the war the federal government had been attempting to convert more of the productive capacity of the U.S. from heavy goods to consumers' goods in the belief that it might cure some of the nation's economic ills. During the war, with the great need for heavy steel castings instead of light sheets, there was a conversion to heavy goods production and new plants were built for this purpose. New nondurable goods capacity of some manufacturers increased 25% from the beginning of the war to 1943; durable goods capacity in some companies was up 600% in the same period. In this new industrial machine, plants became larger and larger. New plants sprang up in places that were not regarded as centres of large-scale manufacturing. Large aeroplane plants appeared in Fort Wayne, Ind., Oklahoma City, Okla., and in Wichita, Kan. Aluminum plants were built along the Columbia and Tennessee rivers in order to make use of abundant electric power. New steel plants were built in Utah—far away from the typical steel locations on the Great Lakes, at Pittsburgh, Pa., along the eastern slope of the Appalachian mountains, and around Birmingham, Ala.

The policy of giving the war contracts to the large, wellknown firms had to give way. In order to realize large production, it was necessary to utilize manufacturing plants, both large and small. The system evolved was the use of subcontracting. A large company received an order for a finished product. There were many parts it was unable to produce, so it in turn gave a contract to another manufacturer to make the part. This manufacturer in turn frequently subcontracted the job. In a sense each of these subcontractors became an operating division of the prime contractor. Yet many a small manufacturer had subcontracts from several prime contractors. Through this system, the small manufacturers were brought in touch with large-scale manufacturing methods. They learned them, and they reorganized their plants to utilize them. It seemed very probable that this would work a lasting change upon the economy.

During the war, transportation reached a critical stage. As has been mentioned, railroads were hard pressed, yet the volume of freight increased greatly. They handled it all, largely by increased loads per car, decreased numbers of bad-order cars awaiting repairs and by reducing unloading and loading times. Passenger travel increased 50% and was accommodated by using Pullmans only on longer runs, leaving the short trips to coaches. Even these coaches were so crowded that it was common for passengers to stand in the aisles for many hours. Ocean shipping was also a bottleneck because of the shortage and loss of ships and because of slower schedules. New shipyards broke this bottleneck with the building of Liberty and Victory ships. The overseas shipping was also helped by flying planes, loaded, direct to the theatre of operations.

The migration of management to government jobs in Washington, D.C., during the defense period was changed to a migration of management into the army and navy, where these men held key spots in controlling the production and flow of war materials.

The unemployment situation that so plagued the country in peacetime had now turned into a manpower shortage. To operate the new and enlarged plants, to supply the multiple shifts and to provide a rapidly expanding army and navy required a huge manpower supply. The War Manpower commission was established in an effort to balance the demands from the many sources and to stabilize the situation. In the plants producing civilian goods-the plants which had to sell under ceiling prices -the work-week was kept at 40 hr.; as the manufacturer could not pay time and a half for overtime, sell at or below the ceiling price, and make a profit. This ineffective utilization of manpower was one of the sore spots of the economy. Organized labour was also making new demands. It wanted a wage to compensate for the rising cost of living. In return for a no-strike pledge it demanded

a maintenance of membership clause in the new contracts. As a result of the overtime pay plus the relatively small rate increases granted, the workers' take-home pay increased about 50%.

Increased money in the hands of the workers gave additional buying power, yet the quantity of goods available for civilian purchase was no greater than it had been before the war. The miracle was that there was so large a quantity available. The Christmas buying rushes were far larger than usual. All of this gave rise to the much discussed inflationary gap. If all the money was to be spent for the limited supply of goods available, prices would inevitably increase. Price ceilings prevented this inflation; then, with price no longer the regulator between supply and demand, rationing of materials, directives and other government procedures were substituted. A distinct effort was made to take this excess money out of the consumers' hands through vigorous taxation and extensive bond drives, and it was estimated that about \$35,000,000,-000 went into bonds and bank accounts. Another large portion went into the real estate and securities markets, driving prices up. The Dow-Jones average of 30 industrial stocks, which had stood at 111 in Dec. 1941, averaged about 166 in May 1945 when victory came in Europe.

The priorities system of the defense period began to run into trouble. Several different agencies were granting priorities, which soon exceeded the amount of goods available to fill them. Various remedies were proposed, and the result was the Controlled Materials plan. This provided for an over-all control board which forced each ultimate user of the critical materials (army, navy, civilian) to make a statement of its needs for the coming period. The available supply was then distributed among the three in proportion to the urgency of the need. Each representative was then responsible for allocating a proper amount to his prime contractors and these in turn to the

Ironies of production and consumption in peacetime and wartime were pictured in this cartoon captioned "The Storm" by Herblock of N.E.A. Service, Inc.



subcontractors. By centralizing the top planning and decentralizing the details, material distribution worked reasonably well.

In 1944 many businessmen believed the end of the war was in sight. The problems of production for war were mostly solved, and reconversion problems became the chief concern. Industry started to make plans-for new products, personnel changes, new markets and new or revised marketing methods. They worked under great difficulties. Over all there hung a general fear of depression, based in part on the lack of balance in productive facilities for the peacetime demand. In part, also, the fear arose from the anticipation of unemployment when war production ceased and demobilization took place. Labour was also dismayed over the prospect that the cost of living would rise simultaneously with reduced labour income, as a result of the loss of highly paid jobs and overtime pay in war plants. Workers were naturally unhappy at the thought of the smaller take-home pay of

Yet there was the prospect of undreamed-of prosperity; the workers had accumulated large sums in war bonds and other savings which could be used to buy the new durable goods whose purchase had been postponed. During 1944 there were even some war contract cancellations, tempting business to develop trial models and to get ready for immediate reconversion. Industrial production sagged. Then came the Battle of the Bulge, and the military situation in Europe looked more serious for a while. Reconversion and contract cancellation were forgotten in a new swing to all out production. But at the beginning of the second quarter of 1945 it was apparent that Germany was beaten and contract cancellations began again, even before the surrender in May. This started a distinct downward movement in industrial production that continued through the date of victory over Japan in August. (See also WAR PRODUCTION.)

Reconversion 1945-46.-When reconversion got into full swing about Sept. 1, 1945, the index of industrial production was far below its wartime peak. In September it stood at 167, about one-third below the 247 of October and November 1943. Cutbacks had come fast with the surrender of Germany; after the defeat of Japan almost every government contract was cancelled. The first phases of this reconversion were far smoother than had been expected. Industry had its plans ready. Large war machinery was moved to storage and the long assembly lines for peacetime goods were put in place. In some plants these new assembly lines were in place and in operation before the half-finished tank on the neighbouring line had been removed. In some industries there was no reconversion problem. Cigarettes were suddenly plentiful, and the line-ups outside the local drug store disappeared. The heavier goods, however, the new refrigerators and automobiles, e.g., did not flood the market as rapidly. Even in 1946 a new model was a sight to command attention.

The predicted unemployment of 8,000,000 within a few months after the end of the war did not materialize. For September the estimate was nearer 1,500,000. The prediction that the economy would fall apart with the cessation of government spending also did not come true. By Nov. 1945 production had begun to increase and the industrial production index stood at 168. Then trouble began. Industry was plagued with strikes. The General Motors strike continued from Dec. into Feb. 1946 followed

by a severe coal strike that threatened the power supplies of many of the large cities. Later there was a two-day nation-wide strike on the railroads. Each of these seriously set back the expected reconversion, and the many subsidiary strikes hampered even more. As a result, the index of industrial production, which had risen from 152 in February to 168 in March, declined to 160 in May 1946.

These industrial difficulties and the relatively low index of production had a direct effect on consumers generally. For, although all production was for civilian use, few of the long-awaited consumers' durable goods were available for purchase. Moreover, serious food difficulties arose. In order to prevent mass starvation abroad it was necessary to make large shipments of food to the afflicted countries. In July 1946 there was even a bread shortage in the U.S.

One of the greatest accumulated shortages of wartime was in housing. The future of the building industry had seemed bright, but progress was slow because of shortages of essential material and labour; it was necessary for the government to continue restrictions and the use of priorities for building during 1946.

It was widely believed that many of the shortages were caused by the control policies of the government. The controlled materials plan of wartime had disappeared, but the price ceilings remained. Because of changed prices, price relationships which had been in accord with the economic conditions when price control was established no longer held. With the expiration of the price control law on June 30, 1946, and Pres. Truman's veto of its replacement (because he considered it too weak), business was left temporarily with a free market. As was to be expected, some prices were immediately raised, but others held at existing levels because of the fear of consumers' strikes, of creating ill will, or of losing the market to competitors. Business had high hopes that the economy would get back to normal. However, a new price control bill restored ceilings on many products in July, 1946 and on certain food products, including meat, on Aug. 20. The new bill also provided for orderly decontrol of all prices (except rent) by July 1947. As a result of the interrupted ceilings, chaotic conditions existed in respect to meat products in particular. This led to Pres. Truman's proclamation of Oct. 14, 1946, which removed all controls from meat; in November practically all controls were removed.

In 1946, business men were still looking forward to a postwar boom financed by the large amount of consumer purchasing power invested in war bonds and savings accounts. The stock market reflected the sentiment with the Dow-Jones industrial average more than 200. In September the market broke sharply and started downward; in October it was about 20% below the spring high. Production was increasing, prices were higher, but in certain spots business men were growing a little apprehensive of the future.

Finance.—Beginning with the Lepression in 1931, there was a gradual rise in the gross U.S. public debt from \$17,000,000,000 to \$36,000,000,000 in 1937, which continued to \$49,000,000,000 in 1941. Then, with the necessities of financing the war, the climb became more rapid, reaching a height of \$279,000,000,000 in Feb. 1946. During the following months of 1946, about half of each of the maturing issues of certificates was paid in cash and the other half refunded. This was done by drawing down the treasury balances created during the last of the big war loan drives and not by utilizing an excess of receipts over expenditures. The great wartime increase in debt was

financed by the sales of securities to banks and government agencies (50%), to institutional investors (12 $\frac{7}{2}$) and to private investors (38%). Particularly important from the economic point of view was the sale of savings bonds (later called defense and war bonds) to the small investor. These were issued in denominations as small as \$25, and subscription was encouraged through pay roll savings plans and public appeals. Two other types of savings bonds were also issued during the war for larger investors. A unique feature of these bonds was that the holder could redeem them at any time after a short initial waiting period. This had the effect of creating a large demand liability upon the treasury. The bonds were first issued in 1935; \$1,000,000,000 were outstanding in 1938, and \$4,000,-000,000 by 1941. The following years the amount outstanding increased to \$46,000,000,000, and in May of 1946 the amount had reached \$49,000,000,000.

Government expenditures increased from \$8,000,000,000 in the fiscal year ending June 30, 1937, to \$9,000,000,000 in 1940. Thereafter the increase was rapid, reaching a peak of \$100,000,000,000 in the fiscal year ended June 30, 1945. Ninety per cent of the latter sum was for national defense. In 1946, expenditures dropped sharply to \$65,000,000,000.

Government receipts from taxation and miscellaneous sources were about \$5,000,000,000 in 1937, of which 43% came from income taxes. By 1945, the receipts were more than \$46,000,000,000, more than nine times the amount in 1937, yet only 46% of the total expenditure. Of this 1945 total, income taxes contributed 72%, a fifteenfold increase in the total revenue raised from this source.

State government finances improved greatly during the war. The curtailment in revenue from gasoline and cigarette taxes was more than offset by the large yields in income, corporation, luxury and sales taxes. At the same time, expenditures for relief were very low and construction programs were suspended. Thus the states accumulated large surpluses which enabled some of them, notably New York, to reduce the rate of taxation. Other states conserved their surplus funds for debt retirement, veterans' benefit programs and for new construction programs which included schools, public buildings, highways, grade crossing eliminations, hospitals and irrigation projects.

During the ten-year period 1937-46 the stock market had its ups and downs, as evidenced by the Dow-Jones industrial average. On March 10, 1937, the industrial average reached a high of 194.40. From there it moved downward with interruptions, to March 31, 1938, when it reached a low of 98.95 a few months before the index of industrial production reached its low. There was a rapid recovery to 158.41 on Nov. 12, 1938. This was followed by a sharp downswing to 121.44 on April 8, 1939, caused by the war scares; then the market rose back to 155.92 on Sept. 12, 1939, just after Germany's invasion of Poland. From that point on the market went irregularly downward, reflecting the good and bad moments of the war until it reached a low of 92.92 on April 28, 1942. From that point the average moved upward until it reached a high of 212.50 on May 29, 1946. During the following two months of 1946 it moved in a narrow range slightly below the May high. Throughout Sept. 1946 the market dropped rapidly and the Dow-Jones industrial average stood near 170 during the first weeks of October.

During the entire ten-year period, the yield on long-term bonds moved downward. The yield on Moody's Aaa bonds dropped from 3.26% in 1937 to 2.49% in 1946, a 24% decline. This decline was aided by the government in its desire to keep its own interest cost at a min-

imum. The Baa bonds had an even greater decline, from 5.03% in 1937 to 2.98% in 1946. The spread between the two types of bonds progressively narrowed. In 1937 the Baa bonds were yielding 54% more than the Aaa bonds, indicating the premium required by investors for the greater risk. By 1946 this spread had been reduced to such a point that the Baa bonds were yielding only 20% more than the Aaa bonds. The change in differential was partly a result of the decline in yield of the Aaa bonds, tempting the investor into lower quality securities in an effort to maintain his income. It was also a result of the high level of economic activity, causing the investor to minimize the chances and the consequences of depressed business conditions.

The yield on municipal bonds dropped very rapidly in relation to the drop in yield of other types of securities. In 1937 municipals were selling to yield 3.10%, only slightly under that of Aaa corporate issues. But by 1946 municipal bonds were selling to yield only 1.50%, a full 40% less than the Aaa corporate bond. This change in relationship was caused by the federal income tax structure. Municipal bonds were exempt from taxation, and with increasing tax rates, the relative advantage of owning them in preference to taxable bonds increased.

This reduction in the interest rate on long-term bonds made it profitable for corporations to call many of their outstanding bonds and to issue new ones at a substantial saving in interest. There were also cases where preferred stocks were called and replaced by bonds. Many of the refunding issues were sold through the regular channels of distribution. There was increased control of the new issues through the Securities and Exchange commission. One of the noteworthy results of the commission's requirements was the greater amount of information available to the investing public.

Another development was the increasing sale of securities to underwriters by competitive bidding instead of placing the securities with the company's traditional investment bankers. In addition to the sales through the underwriters, there were many sales directly to large institutional investors including the life insurance companies. The new level of low yields on securities forced life insurance companies to increase their rates by one sixth. In the years 1937 through 1939, the net proceeds of new security issues ran slightly greater than \$2,000,000,000 per year. In 1940 and 1941 it ran about \$2,500,000,000 per year. During the next two years the volume was considerably smaller, partly because of the huge volume of federal securities which the market was called upon to absorb. In 1944 new corporate security issues amounted to almost \$3,000,000,000; and in 1945, with a slackening in the rate of government issues, private financing jumped to more than \$5,500,000,000. Through the early part of 1946 the rate of issuance continued at a high level. More than 80% of the new issues were for refunding purposes. Public utility companies accounted for almost half of this refunding, and the rest was about evenly divided between railroads and industrial corporations. Almost all of these new securities were bonds, although in 1946 stocks made a somewhat larger contribution to the total than previously.

During the decade, business also turned to sources other than the security markets for its financing. Outstanding loans of the Reconstruction Finance corporation to business amounted to \$125,000,000 in 1939. By 1942 twice this amount had been loaned. The Defense Plant corporation was also financing business in an indirect way through its building of war plants for the use of private corporations. Factoring of receivables was appearing in types of busi-

ness not customarily using this form of financing. Business was also borrowing to a large extent from the banks. Assignment of inventories as security for bank loans through the aid of field warehousing was becoming prevalent. Formerly, the traditional bank loan had been for a fairly short term. By the end of the decade, banks were making "term" loans to business for periods of several years. Frequently, these loans were so large that several banks across the country, or even competing banks in the same locality, participated in the loan.

All of the loans of this period were made at fairly low interest rates, and several large corporations borrowed in order to retire outstanding bonds which bore a higher rate of interest. During World War II there were the V, the VT, and the T loans by banks on amounts due or about to become due on war contracts. These loans were partially guaranteed by the war or navy department or the maritime commission. Provision was made that if the contract should be cancelled with a consequent delay in receipt of the funds, the loans were automatically extended. Contractors were thus provided with adequate finances to continue business where their working capital might otherwise have been frozen by a large cancellation. The General Motors corporation received a \$1,000,000,000 line of credit under this arrangement. It was the largest bank credit ever extended to an industrial or commercial enterprise.

The government guarantee of loans also became important through the Federal Housing administration, the amount of guaranteed loans rising from \$94,000,000 in 1936 to \$6,700,000,000 in 1946.

The large volume of war business brought about interesting changes in the composite balance sheet of 120 large corporations (prepared by the National City bank of New York). From 1940-44 total cash increased about 40%; government securities about eleven times; receivables about 80%; inventory about 60%. The gross fixed assets increased only 10% but because of a greater increase in the depreciation reserves the net fixed assets actually declined slightly. The increase in assets was financed largely by an increase in the current liabilities, which more than tripled. There was also about a 20% increase in the capital stock and surplus. By the end of 1945, several months after the end of the war, most of these upward trends had been reversed. Cash, government securities and gross plant had declined; so had the current liabilities. Inventories, capital stock and surplus continued to

Consumer short-term debt usually rises and falls with the business cycle. It followed this pattern throughout the first years of the decade 1937-46, reaching a high of \$9,500,-000,000 in 1941. Later, consumer scarcities became acute, and the consumer durable goods usually bought on the instalment plan (particularly automobiles) were no longer available. In view of this situation, the board of governors of the federal reserve system issued Regulation W, which put severe limitations on the use of consumer credit, not only on instalment sales but also on the regular charge accounts of the department stores. Officially, the general purpose of controlling the use of credit was to divert demand from the industries which would otherwise be contributing to the war production, to restrain the inflationary tendencies and to make a better consumer demand and debt structure for the postwar period. Immediately after the end of the war consumer debt began to rise. In the prewar period, commercial banks had only about 16%

of the consumer instalment loan business, but by May 1946 they had 37%. This expansion was largely at the expense of the industrial banks and finance companies.

The commercial banks had an important role to play throughout this period. They were called upon to buy large quantities of bonds and short-term securities from the government. Such action was possible because of the large quantity of excess reserves and because of revised banking regulations permitting the replenishment of depleted reserves by the sale of bills and notes to the federal reserve banks, and in turn permitting the reserve banks to use government securities as reserve for their note and deposit liability. Directly related to this procedure for absorbing new federal debt by the banking system was the expansion of the total money supply (both bank demand deposits and currency) from \$39,000,000,000 in 1940 to \$171,000,000,000 in July 1946, more than four times the amount just six years before. The banks also loaned large amounts to industry (partly with government guarantee). Demand deposits rose more than 150% as measured by the figures of the reporting member banks of the federal reserve system. The investments of these banks increased 250%, accounted for mostly by the purchase of government securities. However, important as the loans to industry were, the increase was only 65%. The federal reserve system raised the reserve requirements from the minimum provided in the law (7%, 10% and 13%) to the maximum (14%, 20% and 26%) in May 1937, when prosperity was high, reduced them slightly near the depth of the slump in 1938 and raised them to the maximum again in 1941, when the dangers of the inflationary period became apparent. For technical reasons it was necessary to lower slightly the required reserves on large city banks in Aug. 1942.

The banks made two other significant contributions to the war effort: they acted as the focal point for the issuance of government securities in the war loan drives, and they assisted in the rationing organization by establishing

"We'll Have to Keep Them in Step." A reference to the critical labour shortage in the U.S. during World War II, by Bishop of the St. Louis Star-Times



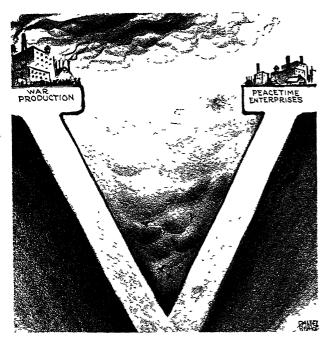
bank accounts not in dollars but in gallons of gasoline, pounds of sugar, pairs of shoes, red points, etc. Retailers could deposit their coupons from the consumer, and draw checks on their deposit in the purchase of supplies. The ration bank accounts were then used instead of the consumers' coupons at all other levels of the rationing control. (See also Banking; Consumer Credit; Debts, National; Income and Product; Stocks and Bonds, Taxation.)

Labour.-Labour made large gains during the decade; beginning with the National Industrial Recovery act in 1933, legislation was generally favourable to it. The NIRA set up the National Labor board for mediation of disputes and authorized the codes under which labour was frequently granted minimum wages and maximum hours. The NIRA was declared unconstitutional in 1935, but the National Labor Relations act (Wagner act), passed the same year, substantially restored the labour relations provisions. It provided for freedom of association and self-organization; encouraged collective bargaining; and prohibited certain unfair labour practices by employers. The National Labor Relations board was created. This board interpreted and gave administrative meaning to the unfair labour practices enumerated in the act. It also held plant elections to determine collective bargaining agents. As the Wagner act was practically a restatement of the labour provisions of the unconstitutional NIRA, there was anticipation that it too might be declared unconstitutional, and it was not accepted immediately in a wholehearted fashion. However, it passed the test in the U.S. supreme court in 1937, and from that time on the National Labor Relations board gained in power and respect. The Walsh-Healey Public Contracts Act of 1937 forced the adoption of many of the NIRA standards in government contracts more than \$10,000. These included provisions as to maximum hours, child labour, safety and health.

The Social Security act, passed in 1935, did not become fully operative until 1937, when the first pay roll deductions were imposed for old-age benefits. This act provided for three general types of benefits: social insurance, public assistance to the needy and health and welfare services. Under social insurance were the old-age and survivors' insurance provisions and the employment security provisions, including both unemployment insurance and public employment service (administered by the states with federal aid through the U.S. employment service). The USES acted as a regular employment agency until wartime, when its objective was broadened in an effort to channel available workers to places where their services would be most effective. Certain types of labour were not covered under this act. For example, farm labour was excluded and railroad labour was covered under its own Railroad Retirement act passed in 1937.

In 1938 the Fair Labor Standards act (Wage and Hour law) was passed. This provided minimum wages and maximum hours for about 21,000,000 employees. The maximum work week was set at 44 hr. in the first year and gradually reduced to 40 hr. by 1940. The minimum wage was 25 cents per hour the first year and increased to 30 cents by 1939 and 40 cents by 1945. Payment for overtime was required at one and a half times the base rate.

The traditional labour union was usually organized on the craft basis. The men with different skills belonged to different unions, and the unskilled workers were, for the most part, unorganized. In 1935, the Committee for Industrial Organization was formed, without official sanction, by certain of the American Federation of Labor leaders. Its objective was to organize the unorganized workers in



"Not a Victory until the Valley of Depression is Bridged," by Bishop of the St. Louis Star-Times

mass production and other industries on an industry basis. Under this new form of organization all workers in a plant, regardless of skill, belonged to the same union. Leaders of the traditional labour unions opposed this movement and the conflict of opinion within the A.F. of L. (q.v.) caused the industrial unions to be suspended and later expelled. They formed the Congress of Industrial Organizations (q.v.) as a separate federation of unions with John L. Lewis as president in 1938. At this time it had a little more than 3,500,000 members, whereas the A.F. of L. had slightly less than this number.

The C.I.O. had its first test of strength during the period of sit-down strikes in the plants of the "Little Steel" companies, General Motors and others. Injunctions granted by the court restraining the employees from occupying private property were ignored. The C.I.O. was also responsible for the large strikes in the west coast shipping industry in 1937. The major issue of that year was union recognition. In 1938 the strikes were not as numerous, partly because of the sharp business recession. Large and important strikes occurred in 1939; the two major ones were in the coal mines and the automobile industry where the union shop and exclusive bargaining agent clauses were at issue.

There were a great many strikes in the first part of the year 1941. With the extensive U.S. defense program underway, the unions saw a possibility for increased wages and feared the probability of a rising price level. In March, the National Defense Mediation board was created to assist labour and management in settling their difficulties by taking over labour disputes when the conciliation service had not been able to adjust the situation. Strikes were called at Bethlehem Steel, which had resisted unionization when U.S. Steel became unionized in 1937, at International Harvester, where no little amount of violence occurred, at the Glenn L. Martin plant (aeroplanes), where the A.F. of L. and the C.I.O. were competing to organize the aircraft industry, at Allis Chalmers and in the coal fields. In the coal strike John L. Lewis was attempting to organize the "captive" coal mines belonging to the large steel companies, which previously had resisted organization. Refusing to accept the decision of the National Defense Mediation board which rejected the closed shop, he threatened a strike. As no agreement was reached, the miners walked out. About three weeks later an arbitration board awarded them the closed shop and the miners went back to work.

Shortly after the U.S. declaration of war in Dec. 1941, the president's conference was called to bring labour and management together. The National Defense Mediation board, which had become ineffective after the coal strike, was replaced by the National War Labor board. The president declared that there were to be no strikes or lock-outs, that labour disputes were to be settled peacefully, and that the NWLB would handle labour relations difficulties. The unions pledged that there would be no strikes in war material production except in those cases where employers refused mediation, conciliation, or arbitration. The situation was relatively quiet for more than a year. In the first part of 1943, however, many coal miners walked out of the mines in strike against the union leaders' decision, made without consulting the members, to increase assessments and to work a longer week (with time and a half for overtime) in order to meet the war production needs. They did not return until about three weeks later, when Pres. Roosevelt ordered them to do so. In the spring of 1943 there were strikes of automobile and rubber workers against decisions of the War Labor board. The coal miners struck in May to enforce their demands for portal-to-portal pay; Lewis called a temporary truce and, though coal production continued, there was a "war of nerves" for several weeks. When Lewis refused to recognize the orders of the War Labor board, the War Labor Disputes act (Smith-Connally antistrike bill) was passed. This provided, among other things, for a go-day cooling-off period before a strike could be called and gave the government the power to seize the plant in case of a labour stoppage that would threaten war production. The coal mines were seized under this act in June and the railroads in Dec. 1943. All were returned to private operation after the difficulties had been adjusted—usually in a few weeks. The War Labor Disputes act also prohibited labour unions from contributing to political campaigns. This prohibition led important C.I.O. leaders and others to form the Political Action committee (q.v.).

During the war labour problems became more and more difficult. For years many employers had complained of the decreasing efficiency of employees caused, they declared, partly by union "featherbedding" rules and partly by the employees' feeling that they could "get away" with decreased effectiveness because of the employers' fear of the union. Now there was a third factor; the necessity of hiring less-skilled employees. There were also severe shortages of labour in the war industries, and yet there were surpluses at other points. The maldistribution was between geographic centres and between types of work. Many agricultural workers left the farm for jobs in war plants. Yet many city workers, lacking the requisite skills, were unable to get such jobs. Moreover, Selective Service was making serious inroads on the labour force. The difficulties of industry were increased by a number of other factors including: (1) employees changing jobs for higher pay; (2) employers failing to use employees effectively and, in some cases, even hoarding labour; (3) inadequate housing and transportation causing a high labour turnover; (4) employer prejudices in hiring workers; (5) labour

piracy; (6) overconcentration of war contracts in some areas; and (7) the lack of comprehensive over-all training to supply the needed skills. Inflation was another problem, and the competition of employers for workers and the natural desire of all workers to obtain higher wages made a wage-price spiral a distinct probability. Voluntary action worked well during the first two years of war in Europe, but by 1941 this combination of factors created an urgent need for some government control program.

In April 1942 the War Manpower commission was established to co-ordinate the different manpower agencies. It had power only to issue directives and was not wholly effective until it was given real power in December of that year. Basically, its job was to decide who should work where and when. It had the problem of balancing the military needs, the munitions production needs and the civilian production needs. There were two types of control plans used in different localities. The first was applied to jobs in industries confined to a small area. The rule was set up that an employee could not transfer from one job to another without permission both from his employer and from the USES, and a further rule was made that there could be no labour "pirating" by employers. In other areas the second type of control provided that all hiring had to be done through the USES. This second type of control was the so-called job-freezing regulation. Anyone who quit his job without permission was subject to induction by the Selective Service and, if not inducted, could not be hired by another employer for 60 days.

Table I shows a part of the over-all problem confronting the War Manpower commission.

Table I.-U.S. Manpower Distribution, 1941 and 1944

	4th quarter 1941	4th quarter 1944	Increase of decrease
In armed forces (millions)	2.0	11.9	+9.9
Men in labour force ,, Women in labour force . ,, Total labour force ,,	39.9 13.9 53.8	34.0 18.0 52.1	-5.9 +4.1 -1.7
Men employed , , , , , , , , , , , , , , , ,	37.5 12.9 38.8 31.7 42.9	33.7 17.7 43.3 33.6 45.5	-3.8 +4.8 +4.5 +1.9 +2.6
Total employed (millions) Source: Statistical Abstract of U.S., 19	50.4 44–45, p. 127 fl	51.4	+ 1.0

The figures show the siphoning of manpower into the armed forces. The fact that the men in the labour force did not decrease by a like amount was caused by the drawing into the armed forces of many young men from schools, and to the influx of older men who had not previously been a part of the labour force. The difference between the total labour force and the total employed represented unemployment, and it was clear that the difference had been reduced. The increased age of the workers was the result of three factors: the drawing of the younger people into the armed forces, the return to work of previously retired people and the postponement of retirement of many who would otherwise have dropped from the total labour force. The reduction in unemployment, retention of older workers in the labour force and the increased length of the work week indicated the WMC's source of the added workers needed for the huge task of war production. The part of the over-all labour picture which could not be shown as well statistically related to (1) the need for people with specialized skills in proportion to the number of such people available, and (2) the reduced efficiency of the workers caused by long hours, work on jobs for which they were not trained and featherbedding.

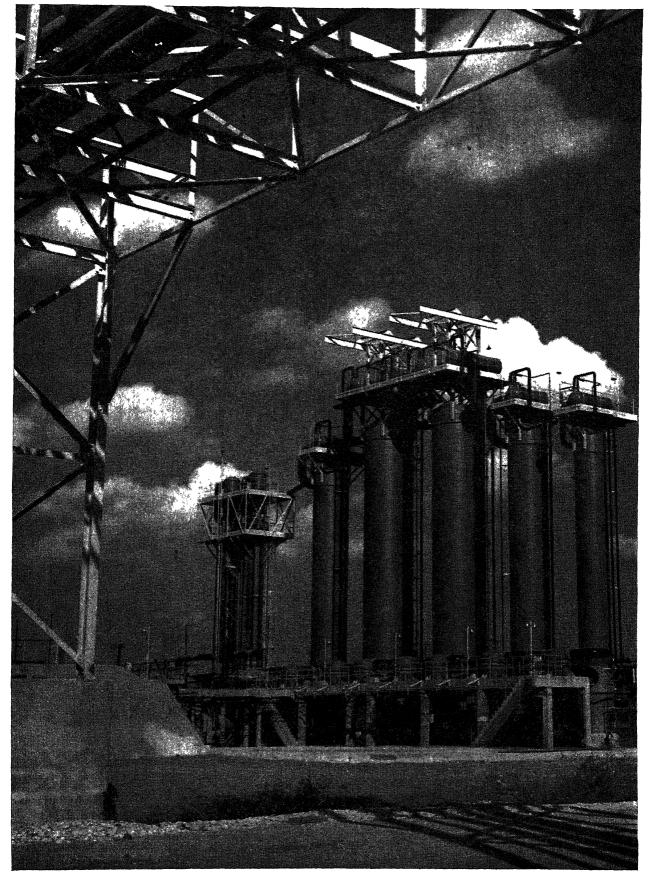
In the spring of 1942, wage troubles arose in the plants of certain of the smaller steel companies, and the WLB set the "little steel formula" in July 1942 as the pattern for general wage increases. The cost of living was calculated to have risen 15% from Jan. 1941 to May 1942, and therefore wage increases were not to exceed 15%. Correction of gross inequities (both interplant and intraplant) by wage increases was allowed as another exception provided by the Price Control act of Sept. 1942. Late in 1942 the Office of Economic Stabilization was created under a power granted to the president under the Economic Stabilization (Price Control) act. This agency was given control over prices of commodities, rents, wages, salaries, rationing and subsidies.

The effectiveness of the wage stabilization work of the WLB may be judged from the fact that the increases actually permitted by the board, averaged over the entire working population, amounted to less than one cent per hour. The other great contribution made by the board arose out of its second main obligation, the settlement of labour disputes not involving wages. Faced with the unions' demand for a closed shop and the employers' demand for a freezing of the status quo, the WLB avoided an impasse by developing the so-called "maintenance of membership" formula. This operated as follows: once a given union was designated as the authorized collective bargaining agency in a given plant, employees of the plant were afforded a two-week "escape" period, during which they had to decide whether they wished to belong to the union or not. At the end of the two weeks, those who wished to stay in the union were compelled to remain in that status for the life of the contract, and those who notified the employer that they did not wish to belong to the union were permitted to retain that status during the life of the contract without loss of job. Both union and employer members of the board came to accept this compromise developed by the public members.

With the coming of peace in 1945, there was temporary apprehension over reconversion unemployment. When this proved to be much smaller than expected, a serious wave of strikes occurred in the steel, automobile, electrical products and nonferrous metals industries. There were also serious strikes of anthracite coal miners and of maritime and dock workers. Many small strikes hampered industry and caused a shortage of important parts through 1946. Serious as these strikes were, they did not threaten a complete paralysis of the economic system as did the soft coal strikes in the spring and fall, and the railroad strike in June. Many cities were forced to curtail electric power consumption more severely than at any time during the war, and the railroad strike threatened certain large cities with severe food shortages.

In this postwar wave of strikes, the usual settlement was an 18–18.5 cent wage increase, precedent for which rested upon a decision of one of Pres. Truman's fact-finding boards early in the strike period. One of the wage arguments most commonly used by union leaders was the ability of the company to pay. A new "method" of wage settlement appeared in certain instances, especially the coal strike: the union made demands, the established conciliation machinery reached a formula for settlement, the union refused to accept the recommendation, a presidential emergency board (established for the specific case) reached a different formula for settlement which the union

Styrene plant at Velasco, Tex., which operated under government contract during World War II to produce hydrocarbon used in the manufacture of synthetic rubber. The plant had a capacity of 75,000 tons annually



again refused in order to hold out for higher stakes which could be obtained when the president was forced to intervene. These labour difficulties became so serious that drastic antistrike legislation was brought before congress. When the railroad strike was broken in May 1946 by the government, the strike period reached its climax. After that, public opinion cooled, and the more drastic legislative proposals were dropped. The Hobbs act was passed shortly afterward, amending the anti-racketeering bill and making violence and destruction of property illegal.

In 1946, labour discussions centred around the guaranteed annual wage, security questions, production and efficiency of workers, vacations with pay, health, safety and pensions. Even the 30-hr. week was mentioned. The question had been raised as to why, if the government could bring about full employment in wartime, the nation could not have full employment in peacetime. After congress rejected drastic legislation requiring the president to present annually a program of public works and other economic measures designed to bring about full employment, it passed the Employment Act of 1946. This act created (1) a Council of Economic Advisers to aid the president in drawing up a program to promote maximum employment and production, and (2) a joint congressional committee to make findings with respect to the president's recommendations. The first appointments to the council were generally considered to be able men and to be above politics.

During the decade 1937–46, the average hourly wage of employees in manufacturing increased from about 62 cents in 1937 to 66 cents in 1940, to 73 cents in 1941 and to \$1.04 by V-E day in 1945. From that time until Nov. 1945 the average wage fell to 99 cents before it began its climb until it stood at \$1.07 in May 1946.

There was no consistent series of figures on total employment available, but the U.S. department of labour's indexes of production-worker employment in manufacturing gave a good picture of the volume of employment during the period. The index stood at 104.8 in Jan. 1937, rose to 112.3 by August and then slipped down to a low of 85.5 in June 1938. The rise from that time on was almost uninterrupted, reaching 107.0 by Dec. 1939, 117.4 by the end of 1940, 141.1 at the end of 1941, 168.7 by the end of 1942, to a peak in Nov. 1943 of 181.9. From that point it slipped back to 159.8 in May 1945 and 128.5 in September after V-J day. The index rose fairly steadily from Oct. 1945 through Jan. 1946 reaching 130.2. With the strikes in February it dropped back to 121.9 but rebounded quickly, reaching 138.4 in June 1946. (See also EMPLOYMENT; LABOUR UNIONS; STRIKES AND LOCK-OUTS; WAGES AND HOURS.)

Volume of Trade.—U.S. domestic trade at the retail level increased constantly from 1939 through 1945. The 1937 sales had been \$42,000,000,000; the total decreased slightly in 1938, but by 1939 it was back to the 1937 level. By 1945, total sales had risen to \$75,000,000,000. Table II shows total retail sales annually from 1937 through 1945 both in total and divided between durable and nondurable goods.

In the first seven months of 1946, retail sales totalled \$52,000,000,000,000,000,000,000 was in durable goods. From these data the wartime shift from the manufacture of durable goods for civilian consumption is apparent. During the war period, durable goods sales rose until the U.S. entered the war and then dropped back to the level prevailing before the start of the war in Europe.

From 1939-44, the value of most types of durable goods sold increased substantially; jewellery led with an increase of about 200%. But sales of automobiles and accessories declined. They dropped to less than half of their former level, as productive capacity was made available for munitions. Nondurable goods sales about doubled during this period. Most individual groups did the same. The widest variations were filling stations, the sales of which declined slightly, and eating and drinking places, the sales of which nearly tripled.

Table II.—Total Retail Trade in the U.S., 1937–45 (billions of dollars)

	•		
	Total	Durable goods	Nondurable, goods
1937	42	11	31
1938	39	9	30
1939	42	10	32
1940	46	12	34
1941	55	15	40
1942	58	10	48
1943	64	10	54
1944	69	10	59
2010	7.5	7.1	4.4

「Source 1939-44: Statistical Abstract of the U.S., 1944-45, 1937, 1938, 1945 computed from Survey of Current Business.

At the wholesale level, sales were as shown in Table III.

Table III.—Wholesale Trade and Inventories at Wholesale Level in the U.S., 1937-44
(billions of dollars)

												٠		Sales	Inventory end of year
1937														58	3.9
1938														50	3.3
1939														55	3.5
1940														62	3. <u>7</u>
1941														84	4.7
1942														93	4.0
1943														99	4.0 4.0
1944														103 not available	4.0
1945	٠	•	٠	٠	٠	٠	•	٠	٠	٠	•	•	•	nor avallable	4.3

Source: 1937-44: Statistical Abstract of the U.S., 1945: Survey of Current Business.

The rise in sales roughly paralleled that in retail trade. Such a rise in volume of business is typically accompanied by an increase in inventories, but this did not occur during the war years because of the shortages of goods. The demand for goods was so large that they were almost swept from wholesalers' shelves.

Such rapid turnover of merchandise was a great help to wholesalers in that it increased their total profit at a time when their profit margin was being squeezed and enabled them to avoid being caught with a stock of war quality and style goods when better supplies became available.

In selling \$47,000,000,000 worth of merchandise in 1939, manufacturers used approximately the same channels of distribution they had used ten years earlier. Table IV shows the per cent of sales handled through each channel in both 1939 and 1929.

Table IV .-- Per Cent Distribution of Manufactur ers' Sales by Channel of

		D	str	ь	tio	n,	19	39	7 0	ınd	1	92	9		1939	1929
Own wholesale branches of Own retail stores															23.8 2.8	17.5 2.4
Wholesalers and jobbers															26.5	32.8
Retailers and resale Industrial users	•		•	•	•	٠	•	•	•	•	•	•	•	•	19.9 25.2	18.0 27.5
Consumers at retail				•	•	•	•	•		•	٠	:	:	:	1.8	1.8
Source: Statistical Abstr	ac	t c	f t	he	U.	S.,	. 11	94.	4-	45						

The major change apparent was the decreased use of wholesalers and jobbers and the increased used of manufacturers' own wholesale branches and offices and direct sales to retailers.

There were several important developments in the marketing field during this period. In 1936 the Robinson-Patman act had made it illegal to sell goods if there was discrimination in prices or services between individuals.

Rush of 1946 Christmas shoppers at Macy's department store in New York city. Full employment and the rise in national income brought record sales to retail stores throughout the United States during World War II and the immediate postwar period



It became necessary for sellers at wholesale to justify their quantity discounts and advertising or other selling services, to prove that the discounts or the costs of the services given to some purchasers but not to others did not exceed the savings in selling, delivery, or production costs realized in selling to such purchasers. A further result was an increased interest in the study of marketing methods and costs. For a number of years before 1936 there had been a growing realization of the need for careful study of marketing costs, and the necessity of meeting the requirements of the Robinson-Patman act gave further impetus to this trend. This was particularly noticeable in the attempt to improve methods of selecting, training, and managing sales personnel and in the improvement of incentive payment plans for salesmen and management. There was also an important trend toward more extensive market research, prepackaged items and self-service in retail stores. The Miller-Tydings Act of 1937 clarified the legal status of manufacturers desiring to stipulate the prices at which their identified products could be resold. This practice had been legalized by 40 states and the Miller-Tydings act supplemented these state laws by making such agreements legal in interstate commerce.

With the coming of the war, retail stores faced many problems. Specific problems varied from store to store and usually included one or more of the following: price control, rationing (particularly burdensome to food stores), substitute items, duties to fulfil in civilian defense, patriotic campaigns including particularly war bond and stamp sales, manpower shortages, transportation bottlenecks, unprecedented taxation including the necessity of acting as tax-collector for the government on many "luxury" items. In connection with price control, an important problem arose because of the imposition of a general price ceiling in March 1942 on all Items at all levels of distribution. Because of the normal price lag between wholesale and retail levels, the retailers had an abnormally narrow profit margin in the spring of 1942. It was not until autumn of that year that the situation was alleviated by "rolling back" the prices of wholesalers and manufacturers. But in spite of the many difficulties they faced, retail stores made increased profits. Several factors were responsible. Careful control was exercised over expenses and many expense items were eliminated altogether. Sales volume was very high because of the high level of consumers' spendable income; and, because of the necessity of protecting the majority of retailers, the profit margins allowed by the Office of Price Administration were generally satisfactory.

After 1937 no additional states passed tax laws which discriminated against chain stores, and discriminatory taxes of Kentucky and Pennsylvania were declared unconstitutional in 1938. For several years there had been an attempt by Congressman Wright Patman to put through a bill imposing a fantastic federal tax on chain stores in an attempt to drive them out of business. This was finally overwhelmingly defeated in the ways and means committee and ended a period of discriminatory action against chain stores. During the years immediately preceding the war the chains had undertaken a large program of new construction and modernization. Ten per cent of all units had been built in 1940 and 1941 and 20% of the units had been modernized. The war stopped this major program, but even so the stores were in good shape to go through the war. There was a distinct trend to close many units of the chain store systems and to open larger-sized units. This made it possible to handle the same volume of business in fewer stores. There was also a tendency to curtail the delivery of products on the theory that the chain itself had a delivery system built up, and that this system need not be duplicated with attendant costs.

Materials Control in Wartime.—As the U.S. defense program expanded in 1939 and 1940, the supplies of certain critical materials tightened, and a system of priorities was set up to assist business in obtaining the materials needed for the defense contracts. These early priorities were on a purely voluntary basis, and the preferences were limited to army and navy prime contracts. Later, as the supply situation became tighter, mandatory priorities were inaugurated. Moreover, the volume of priorities soon became so great that it was necessary to replace individual rating certificates with blanket preference orders which gave a procurement rating to a whole general class of products. By the spring of 1941, the system of priorities was proving inadequate, and it was supplemented by the conservation (M) orders. These prescribed permitted and nonpermitted uses for each material. At first only aluminum was covered. Later magnesium, copper, steel, other metals, chemicals, textiles and other products were included. These orders merely restricted the use of the raw material. By the summer of 1941 the limitation (L) orders were being given. These restricted the output of the finished product. The first L orders cut down and eventually prohibited the production for civilian use of automobiles, trucks, refrigerators, washing machines, electrical appliances and other consumer hard goods. The purpose of the orders was twofold: to conserve critical materials and to force the conversion of peacetime plants into the war effort.

More of the preference currency was being given out than there were supplies available, because of the lack of quantitative control under this system of priorities and M and L orders. The preferences were constantly losing value. The A-1 priorities had to be subclassified into A-1-a to A-1-j. Then an AA priority had to be superimposed and on top of that an AA-1 priority. This system was the result not only of lack of quantity controls but also the result of extremely difficult integration and scheduling of material needs. Unbalanced and contradictory allocations were possible under this system. The paper work of manufacturers was multiplying, and a premium arose on competitive expediting of materials. These difficulties led to the formation of the Production Requirements plan (PRP), established in Nov. 1941 on a voluntary basis. This plan permitted manufacturers to present to the War Production board a complete picture of their operations and to state their production material requirements. Then priorities were granted for the particular production schedules on a quantitative basis: they were not granted as a means of expediting an already laid-out schedule. As long as there was a large segment of industry outside the plan, however, it could not be wholly effective. Wide areas of consumption requirements were unknown. Consequently, in the third quarter of 1942, the PRP program was made mandatory for all except the smallest manufacturers. This was a definite attempt to bring together all information on requirements for the materials in short supply and to allocate the prospective supply of these items.

By the third quarter of 1943, the Controlled Materials plan was set up as an improvement on the PRP. The same basic concept of allocating materials to meet specific production schedules was used, but the procedure was substantially altered. Under this system, a vertical allocation plan was used. Allotments were made to specific programs. The government procurment agency received an allotment which it divided among its prime contractors. These in turn passed parts of their share on to the subcontractors and so on down the line. It proved a far better system than the PRP under which direct applications for materials were received from all levels of production. The War Production board in this change lost definite control over inventories but gained a more important control over programs and brought about a better balance in the tight war economy. The actual Controlled Materials plan itself covered only three basic metals, but the same principles were applied for other materials in short supply.

In the summer of 1944, when it appeared that the war might end shortly, the War Production board began preparing plans for removing the controls and returning the country to the normal free economy. Restrictions were removed from aluminum and magnesium for experimental models of peacetime products, and prohibitions were removed on unrated orders for capital equipment. (The removal of prohibitions did not automatically allow such orders to compete with war orders, for the latter still had priorities; such orders could be filled only if idle capacity was available to produce the goods.) The Spot Authorization plan was established to absorb unemployment whenever it might be created by military cutbacks. In Dec. 1944, military reverses retarded the operation of the plan, but all was in readiness for V-E and V-J days in the spring and summer of 1945. Two hundred regulations were lifted between the European victory in May and the Asiatic victory in August. By October only a few of the WPB controls remained. These were primarily to prevent speculation and hoarding in scarce commodities and to regulate their consumption until supply became normal, to assure the fulfilment of the few remaining military orders and to give a preference rating to any order to ease a bottleneck that might hamper civilian reconversion. The War Production board was changed to the Civilian Production administration, which continued to exercise such powers, particularly in the housing program, throughout 1946.

Donald M. Nelson (left), chairman of the War Production board, testifying before the committee headed by Sen. Harry S. Truman (facing Nelson), which investigated lags in the U.S. national defense program during 1942–43

New Construction.-The last big boom in residential building prior to 1937 occurred in the 1920s. In spite of the need for new housing, caused by the normal growth in population and the depreciation of residential property, there was a virtual cessation of new construction during the early 1930s. During the 1920s there had been a swing toward home ownership which was largely nullified by mortgage foreclosures during the depression in the early 1930s. In 1939 another building boom started. This might have swelled to a large volume had it not been curtailed severely after the U.S. entered the war at the end of 1941. Curtailment was caused primarily by a shortage of materials and skilled labour available for such construction. These factors of production were urgently needed for the war effort, and the rulings of the War Production board made the change mandatory.

The construction of naval and military installations and of industrial facilities for the war machine began in a small way at the start of World War II, when the purchasing commissions of Great Britain and France began to place large orders and to provide the funds with which to build the plants. The real upswing in such construction came in 1941, when it appeared that the British empire and the Union of Soviet Socialist Republics would need to devote their total resources to winning the war, and when Pres. Roosevelt pledged "all aid short of war." The peak construction activity occurred in 1942, and after 1943 new construction was on a limited scale. This did not indicate a depression of activities and a hindrance to the war effort, but rather the virtual completion of the total war plant and hence the ability to devote resources, materials and manpower to producing the actual munitions for war. In 1939 it was estimated that the total productive capacity of the U.S. had cost about \$40,000,000,000 to construct; by 1944 facilities costing \$25,000,000,000 more had been added. Even allowing for depreciation and the higher cost of building, it was fairly safe to say that the industrial plant of the country had been increased 50%. Several industries were built virtually from the ground up. These included synthetic rubber, aviation gasoline, explosives, guns and ammunition, aircraft, shipbuilding, aluminum and magnesium. Of course, many of these indus-





"Uncle Gulliver," picturing U.S. industry hamstrung by labour disputes after the close of World War II, in a cartoon by Shoemaker of the Chicago Daily News

tries were in existence prior to the war, but the war requirements were far in excess of anything dreamed of in peacetime. About two thirds of the cost of this building was paid for by the treasury department directly. A good part of the balance was also paid by the treasury department through reduced income taxes, by allowing a deduction from taxable income of depreciation on war plants at an accelerated rate (20% in most cases).

A third phase of new construction activity got underway almost immediately after the cessation of hostilities in Aug. 1945. This activity was mostly in private residential and industrial buildings. Within a few months, however, materials were in such short supply that it became necessary for the Civilian Production administration to exercise a substantial degree of control. This control took the form of drastic restrictions on all industrial and commercial buildings and on moderate and high-cost residential buildings. It was felt that the greatest need was to create housing facilities for the many returning veterans and their families, and that the low-cost projects would solve the immediate problem most effectively. (See also Building and Construction Industry; Housing.)

Transportation.—By carrying a huge volume of wartime traffic, the U.S. transportation industry made an impressive record in the years from 1937 through 1946. The railroad industry, for the first time, was able to operate at capacity and to enjoy the related efficiencies of operation. This record was all the more remarkable since it was impossible for the various transport agencies to add greatly to their normal prewar equipment. The railroads did, however, improve their fixed plant by continuing the elimination of curves and the reduction of grades. The installation of centralized traffic control on many lines was another important improvement. Through this elaborate signalling and switching mechanism, a single man could control the switches and signal for a hundred miles of road, and a single-track road could be given a traffic

capacity equal to three quarters that of the normal double-track line.

The most significant advance in equipment was in the use of diesel engines. The first lightweight diesel-powered passenger trains appeared in 1934, and it was in 1940 that diesel service was inaugurated for freight service. Diesel-powered freight trains were able to operate at passenger train speed, thus converting a few sections of line into single speed railroads and thereby eliminating the delay involved in switching slower trains onto sidings to clear the track for faster trains.

Before and during the war, several roads came out of bankruptcy, with their debts and fixed charges substantially reduced. Part of the fixed charge reduction was accomplished through the use of bonds on which part or all of the interest payments were contingent upon earnings, and part because of declining interest rates. During the war most of the roads were able to make substantial reductions in their funded debt and the related fixed charges.

The Transportation Act of 1940 relieved the Interstate Commerce commission of the duty of planning for the consolidation of railroads. On all but military and naval property this act also removed the land-grant rates at which certain railroads (which had received large grants of public lands in the expansion era) were required to transport government property at a substantially reduced rate. In 1946 these land-grant rates were removed entirely. (See also Railroads.)

During the decade, public transportation by truck became a more mature business. The Motor Carrier Act of 1935 was just beginning to show its effects by securing more reliable service without destructive competition. This act gave the Interstate Commerce commission complete power over common and contract carriers as to service, accounts, records, reports, hours worked by employees, safety, consolidations, rates, routes and security issues of more than \$500,000. On the other hand, trucking was still hampered by the diversity of state laws regarding axle loads and safety devices. Motorbus companies made some additions of equipment of more modern type in the prewar years and so were able to handle a substantially increased business during the war. Private automobile transportation, never important in the long haul, was severely curtailed during the war as a result of gasoline rationing and the shortage of tires. Public transportation within cities continued to follow the trend from streetcar to motorbus. In some cities, however, the shortage of gasoline and tires made it necessary to put streetcars back in use where tracks and overhead wires had not been dismantled. (See also Motor Transportation.)

The pipe-line business made forward strides through the installation of more and better pipe, diesel pumping equipment and telephone dispatching. The most spectacular addition was the building of the "Big Inch" and "Little Inch" pipe lines from the southwest to the east when the German submarines made petroleum transportation by tanker hazardous and uncertain. These lines dropped out of service toward the end of the war and were offered for sale to private companies in 1946. (See Petroleum.)

The Great Lakes carried an unusually large volume of traffic during the war, composed mostly of ore shipments from Minnesota to the lake ports at the southern end of Lake Michigan, Detroit and the Lake Erie ports from Toledo to Buffalo. The locks of Sault Ste. Marie thus became vital transportation links, as was attested by the heavy military defenses set up in the neighbourhood.

The Ohio canal system did a large war business, the number of tons carried increasing almost 60% from 1937–43. Tonnage carried on the New York state system including the Erie canal increased 32% from 1930–40, but dropped off 40% from 1940 through 1943. The Transportation Act of 1940 brought Interstate Commerce commission regulation to the inland waterways. This was a transfer from the maritime commission and brought with it increased regulation consistent with that applied to other domestic transportation. Under this same act, the Interstate Commerce commission received power to regulate inland water rates, to grant certificates of convenience and necessity and to control consolidations and accounts. Significantly it was not given control of securities, safety, or service. (See also Canals and Inland Waterways.)

Air transportation was characterized by the addition of new types of planes and by lower fares. This, along with the war travel, increased the volume of business tremendously. The air express business also increased rapidly, and rates were lowered substantially in 1946. The Civil Aeronautics Act of 1938 imposed important regulations on this segment of the transportation industry; it also set up the Civil Aeronautics authority which, in 1939, became the Civil Aeronautics board. The latter was given power to supervise rates of common carriers by air, to fix maximum hours worked by air employees, to enforce adequate service, to grant certificates of convenience and necessity for new routes, to control accounting practice, and to promote safety. The reconversion period was characterized by a great many applications for new routes. Many of these were made by regional carriers wishing to extend to important terminals; these often paralleled existing service offered by other lines. There were also many applications for foreign routes by companies which did overseas flying on government contract during the war. (See Aviation, Civil.)

The magnitude of the wartime transportation business is indicated by the following figures showing, for five divisions of the transportation industry, the number of billions of tons of freight hauled one mile for the last prewar year and for two war years:

	Railroads	Truck	Great Lakes	Pipe Line	Inland Waterways
1939	335	35	76	50	20
1943	731	46	115	101	26
1014	740	46	119	110	31

Foreign Trade.-U.S. foreign trade in the decade 1937-46 was divided into two major periods: prewar and war. Both periods were characterized by governmental control. În the prewar period, the various credit and exchange controls were a dominant feature. The U.S. was not a party to these agreements as were many of the European governments, but traders of the U.S. who did business with firms in these countries were subjected to the complications accompanying such controls. The major action of the U.S. in the field of control was the execution of reciprocal trade agreements. These agreements provided for the reduction of import duties on the products of countries which agreed to reduce their tariffs on imports from the U.S. Under the tariff act of 1934, the president was allowed to raise or lower tariffs to a maximum of 50%. Twenty-eight reciprocal agreements were made between 1934 and the middle of 1942.

During the war period the foreign trade of the U.S. was substantially altered in quantity, source or destination of shipment, type of product and terms of payment. The index numbers show the volume and value of foreign trade during the decade.

Table V.—Indexes	of	Foreign	Trade	of	the	U.S.,	1037
	- (1923-2	5 = 10	O١			

	Exp	orts		Imports					
	Quantity	Unit Price	Total Value	Quantity	Unit Price	Total Value			
1937	105	70	74	131	60	79			
1938	105	65	68	94	54	51			
1939	110	64	70	108	55	59			
1940	129	68	88	113	59	66			
1941	154	73	112	134	63	84			
1942	200	89	178	100	72	72			
1943	286	98	281	111	79	88			
1944	281	111	313	120	85	101			
May 1945 (V-E) .	261	115	301	130	88	114			
April 1946	194	103	199	135	92	123			

Source: Statistical Abstract of the U.S., 1944-45; 1943-46 computed from Survey of Current Business, various issues.

Since World War II automatically closed the axis nations to trade, and axis naval action effectively shut off trade with many neutral nations, the U.S. was forced to seek new sources of certain raw materials or to synthesize them at home. Most of the new sources of supply developed in northern North America and in South America, as shown in Table VI.

Table VI.—Source of U.S. Imports by Continent

				• •		•	•••			•••		٠.	•	•••	••	••••		w/ comme	••			
																		Per cent of total value				
																		1938	1940	1942		
Northern I	Nor	th	Αm	eri	ca													13.6	16.6	26.8		
Southern t	Nor	th.	Am.	erı	ca	٠					٠							11.4	98	13.9		
South Ame	eric	α.																13.4	15.0	23.3		
Europe .																		28.9	14.9	7.9		
Asia																		29.0	37.4	12.3		
Oceania						٠										٠		.8	1.3	8.4		
Africa .					•	٠	•	٠	•		٠					•		2.8	5.0	7.4		
Source	Sta	ıtıs	tıça	I A	Ьs	tra	cŧ	٥f	th	e l	J.S	i.,	1	94	44	-4	5.					

The figures in Table VI show only the per cent of total value of imports, which amounted to almost \$2,000,000,000 in 1938, \$2,600,000,000 in 1940 and \$2,700,000,000 in 1942. One must consider the increase in total imports to appreciate the magnitude of the rise and fall in imports from South America. For the continent as a whole, shipments

"Waiting for the New Year." Fitzpatrick's cartoon in the St. Louis Post-Dispatch symbolized the slow-down in the national economy toward the close of 1945, as business men awaited the tax repeal on excess profits which became effective on Jan. 1, 1946



to the U.S. increased 70% from 1938-42. Four countries—Argentina, Bolivia, Chile and Uruguay—more than tripled their shipments to the U.S. These countries continued, as before the war, to ship mostly raw materials. The decreased imports from Europe represented a decrease in the importation of manufactured goods. Thus the over-all picture of imports showed a shift from manufactured goods to raw materials.

As early as 1939 the U.S. government embarked upon a program of stockpiling certain critical materials not produced at home. Under this program, substantial quantities of rubber, tin, quinine, block mica, Manila fibre, and more than 250 other items were imported and stored. By the end of the war the stockpiling program had been reduced to about a dozen items. With both the United Kingdom and the U.S. needing the same raw materials from the world market, there was a possibility that the two nations might bid against one another in an effort to get what supplies were available and thereby increase the prices substantially. To avoid this, the Combined Raw Materials board was established in 1942. Its function was to allocate critical raw materials between the two nations. In the U.S. it controlled the import of many such critical items and limited the imports to public purchases.

The export situation was very different. From 1938-42 the total value of exports increased from \$3,000,000,000 in 1938 to \$4,000,000,000 in 1940 and to more than \$8,000,000,000 in 1942. Table VII shows the destination of these shipments:

Table VII.—Destination of U.S. Exports by Continent

	Per cent of total value
	1938 1940 1942
Northern North America	15.4 18.0 16.9
Southern North America	
South America	
Europe	
United Kingdom	16.8 25.2 31.3
U.S.S.R	
Asia	16.7 15.4 8.5
Oceania	
Africa	3.8 4.0 10.1
Source: Statistical Abstract of the U.S., 1944-	45.

The drop in the percentage of total shipments to South America did not imply that South America received fewer goods. On the contrary, shipments to that continent increased 25% from 1938–42. Otherwise, almost all increases in shipments were directly related to the war effort. The type of product shipped changed substantially. Unmanufactured items dropped substantially and manufactures in both semifinished and finished stages increased.

In March 1941 congress passed the act authorizing lend-lease shipments to the Allies. Sixty-one per cent of the total exports of the U.S. in 1942 were under the lend-lease act. By 1944 this percentage had risen to 80. Between March 1941, when the act was passed, and the end of the war in 1945, more than \$41,000,000,000 worth of goods and services passed to the Allies under the provisions of this act. Twenty-one billion dollars of this amount consisted of ships and munitions, \$8,500,000,000 of industrial materials and products, \$6,000,000,000 of foods and more than \$4,000,000,000,000 of services.

The problems involved in meeting the lend-lease needs of the Allies, particularly Great Britain and the U.S.S.R., were unparalleled. It was necessary to provide additional plant capacity and to train workers and supervisors. The machines needed by the Allies were not only complex but were often of different design from those used in the U.S., and those made for nations other than England had to be based on metric measurements. Added to such difficulties

was the fact that all countries found themselves short of essentially the same materials. In the early stages of the war, the U.S. shipped many critical items to the United Kingdom and the U.S.S.R. as rapidly as they could be produced, even though they were in short supply at home. These countries had lost much of their productive capacity in the early successes of the German armies, and the critical items were necessary to keep their industrial system in balance. It was felt that such shipments at that time would enable them to hold Germany back until the U.S. could get into full production. The need for the supplies for lend-lease shipment was so vast that, to ensure their availability, the War Production board was made responsible for their production. Lend-lease thus became one of the prime claimants along with the army and navy for materials under the Controlled Materials plan.

In addition to the exports under lend-lease there was also a substantial quantity of reverse lend-lease after 1942. This arose primarily through the furnishing of food and materials to the armed forces of the U.S. which were stationed in the United Kingdom, Australia and other countries.

By the middle of 1946, agreements had been made with Great Britain and Turkey regarding the settlement of the net balances under lend-lease. Turkey agreed to pay to the U.S. within 30 days \$4,500,000 in final settlement for goods of a civilian nature which had originally cost about 30% more. Military equipment in Turkish hands was not paid for. The U.S. retained the right to recapture such equipment, but it was generally understood that it would not be done. The British agreement was substantially similar, except that the \$650,000,000 payment was to be made in 50 annual instalments beginning Dec. 31, 1951, with interest at 2%. This agreement was considerably more complicated than that with Turkey primarily because of the reciprocal balances and the various military bases and other installations around the world in which the two nations had a joint interest.

In the first year after the war there were still a few shipments previously contracted for under lend-lease but now paid for under a different arrangement. Foreign trade on the prewar pattern was proving difficult to reestablish because of credit and exchange difficulties and because the conquered nations were still under strict control. The major foreign movement of goods was shipped under the United Nations Relief and Rehabilitation administration. These goods consisted mostly of food and capital equipment to bring the economy of the distressed nations up to the point where they could supply themselves with the goods necessary for a minimum standard of living.

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British Commonwealth and Europe

The Prewar Years.—The decade opened with many indications of a setback in business in most countries. Rearmament was as yet on too small a scale, except in Germany where it had long been in full swing, to be a major factor in the situation. In Great Britain there was evidence of speculative overtrading in several secondary

commodities (pepper, shellac, peanuts) leading to minor crises in the particular markets concerned. There was also a setback on the London stock exchange, caused by fears of a lower U.S. buying price for gold, and it produced an adverse psychological effect on business. During the last quarter of 1937 there were indications of a setback of a more general nature. Trade indices for the whole of 1937 were, however, generally favourable. Wholesale prices had risen, average unemployment for the whole year had declined to 1,283,523 compared with 1,507,979 in 1936, and the volume of foreign trade advanced from $f_{1,227,-}$ 000,000 to £1,474,000,000. The figures for most European countries and for British dominions showed a similar trend. In Canada the index of industrial production rose by 10%. In Australia unemployment declined from 12.2% to 9.3%, while the employment index advanced from 109.4 to 115.6. In New Zealand the employment index rose from 115.7 to 122.9. There was a marked increase of employment approaching 10% in some instances, in most continental countries during the greater part of 1937. In so far as index numbers of production were published, they showed noteworthy gains. Foreign trade, too, expanded to a considerable degree, even though in central and southeastern Europe this was largely due to the heavy purchases which Germany made against payment in frozen

It was in the last quarter of 1937 and more especially in 1938 that the effect of the trade recession began to show in the statistics. Although rearmament had gathered momentum during the greater part of the year this factor was not important enough to arrest the trade recession. Industrial output, railway traffic and other indices of business prosperity showed a marked downward trend in Great Britain until the late summer. Armament industries were unable to absorb all the workers released from such industries as had to curtail their activity, and the rising trend of unemployment persisted throughout the year. Other industrial countries in Europe showed the same unfavourable tendencies, with the exception of Germany, where industries continued to work to the limit of capacity because of the nazi rearmament drive, and France where stabilization of the franc by Paul Reynaud, after many previous unsuccessful attempts, inspired confidence and led to an all-round improvement. Railway receipts, industrial output, the use of electric power, all showed an upward trend. In Germany the only difficulty was a shortage of labour and occasional local shortages of raw material.

European countries producing raw materials were on the face of it in a more favourable position, since German demand for their products ensured them a steady market. During 1938, however, the difficulty of obtaining payment from Germany was becoming increasingly evident, frozen reichsmark balances grew in volume and the governments concerned were gravely preoccupied by the problem they presented. Most of them were unable to check this increase through a curtailment of exports to Germany, since by then they had become economically dependent on German purchases for their prosperity.

In Canada industrial employment declined, and the index of industrial production fell by 10% compared with 1937. Both imports and exports showed considerable declines. The same was true in the case of New Zealand, where the government was forced to introduce a system of licensing imports and exports, and the statutory obligation of the reserve bank to convert its notes into sterling was suspended. In Australia, too, the trade balance was adversely affected even though the industrial employment index showed an increase for the year. A particularly

heavy fall occurred in India's exports. In South Africa, too, exports, other than gold exports, showed a marked decline.

At the beginning of 1939 the unfavourable trend continued. Unemployment rose sharply in Great Britain. The threat of imminent war depressed business, and at that stage this factor far more than offset the increased activity resulting from rearmament. Outside Germany arms industries even in 1939 represented a relatively insignificant fraction of total business activity. During the early part of 1939 coal, pig iron and steel output figures in Great Britain fell considerably short of the corresponding figures of a year earlier. The decline of wholesale prices continued till the spring. Foreign trade, too, continued to decline. Unemployment fell sharply, however, from February onward.

In most industrial countries of the continent unemployment during the opening months of 1939 was higher than during the corresponding period of 1938. Although iron and steel output in Sweden, Belgium and other countries began to increase under the influence of rearmament, conditions on the whole remained far from prosperous.

In the British dominions the demand for food and raw materials was slow to recover. The recession may be said to have come to a halt during the spring of 1939, but there were no indications of any pronounced recovery during the last prewar months. Some improvement in prices resulted from eleventh-hour purchases of raw materials by Germany and, to a smaller extent, by other potential belligerent countries, for the purpose of building up war reserves.

To sum up thus far, the business history of the last three prewar years was characterized by the threat of a slump, accentuated by political uncertainty, but moderated and eventually arrested by the rearmament drive and other measures taken in preparation for World War II. While conditions in 1937-39 were considerably less prosperous than during the immediately preceding years, the extent of the setback was nowhere sufficiently pronounced to make this period one of trade depression. But for the inadequacy of the rearmament drive in the democratic countries it might have been possible to arrest the recession at a much earlier phase, if not to avoid it altogether. However, neither Great Britain nor France, still less so the dominions or the smaller continental countries would in advance of war convert their peacetime production for war requirements. While better use was made of the capacity of the existing arms industries than at any time since 1918, there was relatively little expansion of munition plants or erection of new arms factories.

The Period of Conversion.-The same reluctance to switch over from civilian production to arms production continued to characterize the countries under review during the early period of World War II, in particular during the so-called "phony war." There was some reason to believe that the governments of Neville Chamberlain in England and Edouard Daladier in France had not given up the hope that it would be possible to negotiate a peace with Germany before any serious fighting developed. This was no doubt the reason why during the first eight months of World War II the conversion of industries for war requirements in Great Britain and France proceeded at a snaillike pace. The continental democratic countries and the dominions took their lead from Great Britain, and their industrial war effort was also slow in getting into its stride.

At the same time, the outbreak of World War II completely disorganized normal business. Activity declined in the building industry and in various other branches of civilian production, in view of the uncertain future. In several countries the result was a net increase in unemployment, despite the acceleration of rearmament and the calling up of large numbers of men for military service. Thus, the number of unemployed in Belgium increased abruptly by 33,000 in Sept. 1939. Foreign trade was affected to a particularly high degree. Shipping became totally disorganized and the Allied blockade interfered with the import trade of the continental neutrals. The effect of the war on seaborne trade, paralyzing at first, was subsequently mitigated by new trade agreements concluded between Great Britain and neutral countries. Even so, foreign trade showed strongly abnormal features. They became increasingly so as World War II gradually affected the raw material and labour position. The immediate effect was a reduction in British imports from £84,100,000 in August to £52,100,000 in September, while British exports fell from £38,500,000 to £23,400,000. By the end of the year, however, a partial recovery occurred in both imports and exports. The figures of the other European countries and of British dominions disclosed similar tendencies.

Prices assumed an upward trend everywhere, particularly in Great Britain and the countries of the sterling area, as a result of the devaluation of sterling by 20% at the beginning of World War II. However, a large measure of price control was introduced in many countries, and some essential supplies were rationed. The rising trend encouraged production, and was largely responsible for a recovery in civilian production from the slump it experienced immediately after the outbreak of World War II. The rise in wages and in the cost of living lagged far behind that of wholesale prices, thus promising fair prospects of profit. Nor was taxation prohibitive at the beginning. Among the continental neutrals the expectation was not unreasonable that the experience of World War I, during which neutrals made vast profits, would repeat itself. There was, in fact, ample opportunity for making profits on the sale of supplies to both sides, as Germany and Great Britain endeavoured to outbid each other for any stocks of food or raw materials available in any part of the continent. Pre-emptive purchases, aimed primarily at depriving the axis of supplies from neutral countries. became one of the principal weapons of British economic warfare. The result of such competitive non-commercial bidding by both opponents was a marked rise in the price of many commodities.

Allowing for all the above factors, the contrast between peace trade and war trade was nevertheless not so pronounced as might have been expected. With the lessons of World War I at their disposal, the belligerents were able to introduce at the very outset measures of war economy which had been adopted only at an advanced stage of World War I. Even so, trade was relatively slow in adapting itself to war conditions. "Business as usual" was a popular slogan, and indeed, after the business world in Britain, France and elsewhere had recovered from the first shock, it made an effort to carry on as normally as possible. With the exception of Germany, where business had practically been on a war footing even before Sept. 1939, there was little indication among either belligerents or neutrals of any feverish adaptation of business to wartime conditions. In France, because of the large size of the mobilized army, a shortage of labour soon developed, and

manufacturers and merchants tried to fill the gap by drawing on reserves of inferior labour. But in other democratic countries of Europe, and in British dominions, most people carried on in their peacetime jobs, doing more or less their peacetime work.

Very little was done during the opening months of 1940 to speed up adaptation to wartime requirements. In Britain, the government was engaged in lengthy negotiations with aircraft manufacturers who wished to protect their position after the war when newly built works would become redundant. This attitude was characteristic not only of Britain but also of other democratic countries. Thus, business conditions early in 1940 showed no fundamental change from those prevailing toward the end of 1939. The effect of the blockade on German trade was negligible. There were innumerable loopholes which allowed Germany to import anything it was able to buy abroad, and it was equally able to secure the means of paying for its purchases by exports shipped in circumvention of Allied control.

It was not until after the German occupation of northern and western Europe that business conditions in Europe underwent a fundamental change. In Great Britain, the change of government and the collapse of France inspired at last a real effort to convert the whole economy to war production. Peacetime public works were suspended, in order to concentrate all available labour on war production. In spite of this, the mobilization of Britain's economic war potential made but slow headway. Government departments were not adequately equipped to cope with the immense additional work resulting from the regulation of practically the entire business life of the country. Officials were reluctant to take decisions which constituted a departure from their routine. A situation developed in which business men, to an increasing extent, came to depend on government orders and instructions for the maintenance of their activity; yet these orders and instructions were slow in coming because of official "red tape" and the initial confusion created by the suddenness of the change. This state of affairs existed also in the dominions even though to a smaller degree.

However, unemployment fell by one half in Great Britain and also in Canada during 1940. In Great Britain this was the result of calling up many hundreds of thousands of men and women for military service and civil defense, rather than of an increased volume of production. There was no corresponding decline in unemployment in Australia and New Zealand. It became increasingly difficult to judge business conditions by the usual indices, most of which became hopelessly distorted by the incidence of abnormal factors. Thus an increase in note circulation or bank deposits, for instance, merely indicated a certain degree of inflation caused by methods of war finance and not an increased volume of business. Special arrangements had indeed been made in most countries for the automatic grant of facilities for financing government contracts which gradually increased in relative importance.

Business in Continental Europe.—On the continent business conditions came to depend on direct or indirect German control in all but a few countries. The economies of the occupied countries were gradually adapted to Germany's war requirements. In many instances German interests acquired direct or indirect financial control of many industrial and commercial firms. But even without such control the occupying power was in a position to impose its will on the business communities of the conquered countries. A German request for conversion to arms production amounted to a command. The vast purchasing

power secured by German conquest and exercised by German occupation troops or the German government was used for the purchase of most things that were worth buying. This led to a sharp rise in prices since the occupied countries were rapidly depleted of their supplies of consumers' goods. Although after their defeat they were supposed to be out of the war, in practice, Germany forced them to continue their supplies.

Business in countries or territories not actually occupied by Germany but following within its orbit was affected in a similar way. In the unoccupied part of France political and economic pressure was used to make industrialists comply with German requirements. The import of raw materials and fuel into the unoccupied zone depended on Germany. It was therefore able to dictate the terms under which firms in "Vichy" France were able to keep their works going. In the Danube countries Germany's economic stranglehold which had already been very strong before World War II became overwhelming after the collapse of France.

Among neutrals, business conditions were also affected by the changed situation. Germany did its utmost to fit their economies into the planned "new economic order of Europe." Sweden and Switzerland for their foreign trade came to be almost entirely dependent on Germany and its satellites. They had to adapt their production to a large degree to the changed situation. At the same time, their industries had to provide for the increased demands of their national defense, for both countries prepared themselves to defend their neutrality should this become necessary. In Switzerland, the industrial employment index, after a moderate decline before World War II, showed a sharp rise during the first four war years. In Sweden, the trend was similar though less pronounced. The foreign trade of both countries also showed a steady increase in value, though this for the most part reflected the rise in prices.

Period of Full War Economy.—The date at which the conversion to war economy was complete in any European country or in the British commonwealth was difficult to define. By about 1943 Great Britain and the dominions had more or less attained the limit of their economic war effort. Their production had been converted to the requirements of national defense. In Australia, the index of industrial employment rose from 125.5 in 1939 to 171 in 1943. In New Zealand there was a rise from 124.1 in 1938 to 141 in 1941. Unemployment in Great Britain itself had been reduced to a negligible number of unemployables. As a result of the economic war effort and the shipping situation, and also, to some extent, of the limiting conditions attached to the lend-lease agreement with the U.S., British export trade declined in value from £470,800,000 in 1938 to £232,800,000 in 1943, in spite of the sharp rise in prices. To a very large extent, foreign trade, especially import trade, passed into government hands.

During the period of transition from a peace to a war economy, an elaborate system of rationing and other restrictions was built up. Great Britain's manpower and womanpower came to be mobilized to an extent that compelled reluctant admiration even on the part of the German leaders who sought to hold out the British example as an inspiration to the German economic war effort. The government became the largest employer of industrial labour, and the majority of private employers also worked for government account. The scope for individual initiative in business had narrowed down considerably. Individual firms either worked on government contracts or

produced approved goods for which the government allocated raw material and labour. Production itself became standardized as a result of the official adoption of "utility" types. Merchants largely sold rationed goods, or goods subject to price control.

On the continent, the German occupying power sought to enforce similar discipline on business. Even though, there, noncompliance with orders and regulations was subject to much more drastic penalties than in Great Britain, the extent to which German efforts succeeded was considerably smaller than in Great Britain. In France and in the other occupied countries of western and northern Europe black market dealings assumed very considerable proportions, and overshadowed in importance the volume of transactions at official market prices. This was due in part to the inflationary effect of German methods of exploitation as a result of which there was a strong upward trend of prices. But the main reason was that farmers and other producers in occupied countries considered that it was not only to their interest, but that it was also their duty to divert from official channels as much of their goods as possible. Indeed the more goods reaching the official market, the more would be available for the occupying authorities to divert toward the satisfaction of German requirements. Thus, while in Great Britain all public spirited citizens complied with price control and other restriction measures even though these were against their individual interests, in German-occupied Europe patriotic considerations worked in the opposite sense. Manufacturers in occupied countries found it, of course, much more difficult to divert their output from official channels. They too, endeavoured, however, to keep down to a minimum their deliveries to Germany to avoid, among other reasons, being branded as collaborators with the axis. On the other hand, they had to comply to a considerable extent with German demands, in order to be able to keep their works going and save their workmen from being transferred to Germany as slave labour.

While in Great Britain high taxation absorbed most of the business profits made during World War II, in German-occupied countries taxation was not so high, and in any case black market transactions escaped it altogether. As a result, large fortunes were made, partly through deliveries to Germany, which were paid generously with the money the occupied countries were compelled to provide, and partly through black market operations. In any case rising prices by themselves produced substantial capital appreciations, even though these were largely a mere book profit.

Both in Great Britain and on the continent merchants were able to dispose of their prewar stocks, and carried much smaller stock in trade than in normal conditions. As a result, they were able to pay off their bank debts and had substantial cash balances because of the difficulty of replenishing their supplies. Thus, the extent to which banks were called upon to finance business (other than government contracts) was materially reduced. To an increasing degree banks became the bankers of government ingead of the bankers of business.

In the British dominions, too, business conditions had fully adapted themselves to the requirements of World War II by 1942-43. During the concluding years of the war, Canada, Australia and South Africa steadily maintained industrial production at the peak levels achieved. Under the pressure of wartime requirements India made spectacular progress toward industrialization. There the

great difficulty was to moderate the sharp rise in prices caused by the shortage of supplies, the inflation of the purchasing power of the masses and the inadequate degree of saving in any form other than the hoarding of gold and silver coins. In order to reduce the hoarding of goods, the British authorities had to sell large quantities of precious metals to the Indian public. Even so, shortage and maldistribution of supplies resulted in acute famine.

A factor which increasingly affected business conditions in Great Britain, Australia and other countries of the British commonwealth was the expenditure of the United States forces stationed there pending the attack to be launched on Germany and Japan. It produced a substantial additional demand and led in many instances to a rapid depletion of the dwindling supplies of goods. At the same time it provided an important source of profit to the firms and the governments of the countries concerned.

Last Phase of the War.—During the concluding period of World War II the European neutrals grew increasingly prosperous as a result of their trade with the belligerent countries. To a large extent, however, such trade was paid for by merely adding to the frozen reichsmark claims of the exporting country. This did not, however, affect the exporters themselves, since they had their frozen balances discounted or otherwise "mobilized" by their respective monetary authorities. The system of the Allied "black lists" which placed under boycott neutral firms trading with the axis became gradually more effective as a deterrent, as and when Allied victory became increasingly certain. Many firms preferred to renounce profitable business with Germany rather than expose themselves to the postwar effects of such a ban. Generally speaking, however, Sweden, Switzerland, Spain and Portugal were doing brisk trade with Germany. In Portugal and Spain the prices of some raw materials were driven to fantastic levels as a result of competitive bidding by German and Allied agents. There was a sharp rise of prices during the concluding phases of World War II, especially in Switzerland and Spain due partly to increased purchasing power and partly to scarcity of supplies. In the same way as in belligerent countries, unemployment virtually ceased, and scarcity of labour entailed a sharp rise in wages.

During the concluding years of World War II the main characteristics of business in all Allied and neutral countries under review were the achievement and maintenance of production up to the limit of physical capacity; scarcity of labour and many raw materials; an insatiable demand for goods due to the inflated purchasing power of large sections of the public; the vastly increased role of government in the sphere of business, both as a buyer of manufactures on a large scale and as a regulator of business relations between private parties; and a strong rising trend of prices which, however, was successfully kept under control in a number of countries.

In Germany the iron discipline imposed on business life by the nazi regime continued to prevail to some extent right up to the collapse. The system described by German authors as "static inflation," under which the powerful forces making for a sharp rise of prices were suppressed by measures of control, was becoming, however, increasingly difficult to maintain. Allied air bombing began to affect the capacity of the nation to produce, to pay taxes and to save. The government found it difficult to prevent the development of a vast black market. While prices were effectively controlled almost to the last, many people became increasingly reluctant to sell and preferred

to barter their possessions. The necessity of providing for the indispensable minimum requirements of the population in districts destroyed by air raids, and the disorganization of production and transport by these raids, put the well-established system of rationing to a very severe test. At a later phase business became completely disorganized by Allied invasion in the east and west and in particular by the large-scale flight of the population from the eastern zone of Germany.

In Italy, the slow progress of the Allied invasion resulted in the division of the country into two separate economies, the dividing line being the fighting front, beyond which the German authorities assumed full control. In the southern districts under Allied occupation prices rose sharply as a result of the temporary disorganization of civil administration. Production came almost to a complete standstill. In the northern districts the German military authorities and the Italian fascist puppet government recklessly inflated the currency. In southern Italy, on the other hand, deliveries of American goods somewhat mitigated the prevailing economic difficulties. Even so, practically all business came to be transacted in black markets.

Reconversion to Peacetime Economy.—The termination of World War II was not so sudden as that of World War I. Because of the continuation of the war in the far east, Great Britain and the British dominions could not start on a general reconversion to peace economy immediately after the defeat of Germany. Even after V-J day the progress of reconversion was slow, partly because of the slowness of demobilization and partly because of the preference of the Socialist regimes in Great Britain, Australia and New Zealand for a controlled economy. A temporary increase of unemployment was inevitable, even though a shortage of labour continued to prevail in most industries. In Great Britain the number of totally unemployed on the register rose from an average of 63,000 in 1944 to 374,000 in May 1945. It had declined to 355,000 by Sept. 1946. The conversion of industries for the production of civilian goods made fair progress in 1946. High prices and the certainty of selling anything that was produced created an atmosphere of prosperity despite the resentment of business over the maintenance of controls and over the anticapitalist attitude of the Labour government. Much of the increased output of civilian goods was diverted to foreign markets, and the volume of exports rose sharply, while the home markets were kept short of many kinds of essential supplies. From £29,600,000 in the first postwar month (Sept. 1945) the value of exports rose to £92,100,000 in Nov. 1946. Imports remained high, especially from the western hemisphere. Prices continued to rise, though not excessively.

The liberated continental countries had to readapt their economies to the prewar territorial position. Already before their liberation their governments, then functioning in London, decided to declare null and void any participations in business firms taken by German nationals or even by neutrals after the outbreak of World War II. The denazification of the liberated countries was thus effected without delay. Their physical and financial reconstruction was a more difficult task. Extensive damage had been caused to industrial plant and means of transport during the fighting in 1944-45, and the rebuilding of essential services was a slow and painful process. Nevertheless, gratifying progress was made during 1946, and in every country the volume of industrial or mining output in certain lines approached and even exceeded prewar level. Thus in Belgium industrial production (1939=100) which was at 24% of its prewar level on V-E day had risen to

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83% by July 1946. In Denmark the index of industrial output had declined from 81% for 1944 to 65% in July 1945, but recovered to 96% by Oct. 1946. In France industrial output rose from 49% to 73% of prewar level between Aug. 1945 and Sept. 1946. Coal output actually exceeded the prewar level.

Stringent anti-inflation measures taken at an early stage in Belgium led to temporary inconvenience to business,

Table VIII.—Index Numbers of Employment
Basis 1929 = 100

	S. Africa	Canada	Norway	Sweden	Switzerland	Australia	New Zealand
1937	143.1	97.7	124.9	109.1	78.1	115.6	122.9
1938	148.1	94.8	121.5	110.0	77.9	124.1	124.1
1939	148.9	95.9	125.9	112.7	76.8	125.5	131.3
1940	155.8	112.1	119.3	†89	80.3	130.5	137.3
1941	164.3	143.8		†89	84.3	145.4	141
1942	169.5	1 <i>7</i> 6.3	*95	†92	85.6	162.7	
1943	160	193.5	*93	†93	81.9	171	
1944	161.7	1 <i>90.7</i>	*91	*94	77.9	*136	
1945	*114	*185	*87	*90	*106	*134	
1946(‡)	*117	*170	*99	*100	*116.5	*134	

For figures marked *, first half of 1939 = 100; for figures marked † Sept. 1939 = 100.

(‡) Average for first six months, except for Australia (average of first five months).

Table IX.—Index of Industrial Production

	Basis: 1929 = 1000													
								Canada (1)	Denmark	Finland (2)	Eire	Sweden		
1937								100	136	117	146	151		
1938								90	136	.105	142	152		
1939								99	146	93	149	165		
1940								128	118	37	149	152		
1941								1 <i>77</i>	113	39	138	148		
1942								*216	118	43	113	*87		
1943								*259	119	48	116	*88		
1944								*253	*81	*44	*81	*88		
1945								*21 <i>7</i>	*69	*51	*90	*85		
1946	(3)							*164	*94	*75	*107	*102		
/11	c			Ε.		10	10 -			1025 20	-100			

S Africa

Value

(1) Canada: For 1940 and 1941, the basis is: average 1935-39=100. (2) 1934-36 average =100 (3) Sept. 1946, except Eire (May 1946). Figures with *: 1939=100.

mained intact or even been reinforced, by World War II. They were in a position to export on a large scale, but the problem was to receive payment in the form of imports of goods they needed. Sweden and Switzerland in particular entered the postwar period in very sound conditions.

In Germany, the complete collapse of administrative organization in 1945 resulted in chaotic business conditions. The inflation of the note circulation and the difficulty of buying goods in exchange for banknotes reinforced the development of barter which had begun during the concluding phases of World War II. The devastation of industrial plants, especially in western Germany, left Germany's production system paralyzed, and reconstruction was extremely difficult. In Italy conditions were less unfavourable, even though the depreciating trend of the lira delayed the return of stable business conditions. Germany's former satellites were in a varying state of economic disorganization, the worst case being Hungary.

Notwithstanding the immense difficulties that had yet to be overcome in order to return to normal business conditions in Europe, progress on the whole had been more satisfactory than most people would have dared to expect when hostilities ended.

(See also Exchange Control and Exchange Rates; International Trade; Lend-Lease. See also under specific industries, e.g., Automobile Industry; Iron and Steel, etc. and under specific countries.)

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Tabl	e XF	oreign Trac	de			
(000,000's om	itted) in	currencies	of	countries	concerned	
^		India			Garmany	11

	S. Affica		Canada		inaia _		German	A (i)	Denm	ark	ireiand	
	lmp.	Exp.	lmp.	Exp.	Imp.	Exp.	lmp.	Exp.	lmp.	Exp.	Imp.	Exp.
1937	108.1	39.6	811	1.019	1,592	2,024	5,455	5.901	1,674	1,569	43.5	22.2
1938	100.2	29.5	679	857	1.502	1,624	5,443	5,249	1,625	1,535	41.1	23.9
1939	91.3	34.2	751	942	1,550	1.814	4,800	5,200	1,740	1,578	43.0	26.5
1940	110	35.4	1,082	1.193	1,530	2,092	5,000	4,900	1,377	1,517	46.5	32.7
1941		31	1,449	1.641	1.687	2,212	6,900	6.800	1,311	1,278	29.4	31.7
1942	78	33	1,644	2.386	1.068	2,061	8,700	7,600	1,210	1,053	34.6	32.6
1943	84	36	1,735	3,001	1,134	1,862	8,300	8,600	1,225	1,338	26.0	27.4
1944	85	39	1,759	3,440	2.010	2,111	0,000	0,000	1.167	1,361	28.2	29.6
1945	65	3,	132.1	272.3	182.4	181.7			58.4	75.3		
1946			102.1	17 1.0	. 01.4	1015			50.4	73.3	3.39	2.93
1940												
			Gre	at							Nε	w
	Portug	ral	Brite	ain .	Swee	den	Switze	erland	Aust	tralia	Zeal	
	lmp.	Exp.	Imp.	Exp.	Imp.	Exp.	lmp.	Exp.	lmp.	Exp.	Imp.	Exp.
1937	2,353	1,202	952.7	521.4	2.123	2,000	1,797	1,284	111.6	145.9	55.7	66.3
1938	2,300	1,139	858.0	470.8	2,082	1,843	1,589	1,315	138	138.7	54.8	57.9
1020	2,077	1,336	839.5	439.5	2,499	1,889	1,872	1,297	122.4	119.5		
1939			1,126.1	411.2	2,004	1,328	1,854	1,316			48.8	57.4
1940	2,442	1,619		365.4	1,674	1,345	2,024		143	146.8	48.2	73
1941	2,468	2,972	1,132.4					1,463	134.1	132.7	48.6	66.9
1942	2,477	3,939	991 <i>.7</i>	270.9	1,780	1,319	2,049	1,572	185.2	157.4	52.9	80.1

Figures marked with *=monthly averages †Provisional figures
[1] From 1938 onwards, figures for Germany include Austria; from 1939 onwards the territory of "Great Germany."
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but in the long run they paved the way toward stability. In France, on the other hand, the depreciating trend of the franc made it extremely difficult for the government to restore anything approaching normal conditions in business. The black markets that developed during the German occupation remained the predominant feature of French economy even after liberation. Prices fluctuated widely, and had a distinctly upward trend. This, together with internal political developments, gave rise to much-industrial unrest. In Greece, business became disorganized through extreme inflation. It proved impossible to achieve stability even after a most drastic devaluation of the drachma.

Neutral countries benefited by the fact that both their system of production and their financial system had re-

Butadiene

See CHEMISTRY; RUBBER.

Butler, Pierce

Butler (1866–1939), U.S. jurist, was born near St. Paul, Minn. on March 17, 1866, and received his bachelor's degree in 1887 from Carleton college, Northfield, Minn. He was admitted to the Minnesota bar in 1888 and practised law in St. Paul until President Warren G. Harding nominated him associate justice of the U.S. supreme court Nov. 23, 1922; he was confirmed by the senate the next month and took his seat Jan. 2, 1923. He was an outstanding conservative on the supreme court bench, and, although a Democrat, voted consistently to annul legisla-

tion of the New Deal. Justice Butler died at Washington, D.C. on Nov. 16, 1939.

Butter

World trade in butter before 1937 was centred in the United Kingdom and Europe, with far-away New Zealand and Australia participating. The United Kingdom was the principal importer, taking an average of 912,000,000 lb. in 1930-34; Germany was second with a 186,800,000 lb. average. The sources of exports were Denmark, averaging 352,286,000 lb. in 1930-34; New Zealand, 253,300,000 lb.; and Australia, 200,900,000 lb. The United States was taking a balance of imports. World War II cut off the trade of Denmark to Great Britain and shifted it to Germany. The shipments from New Zealand and Australia were reduced, and the burden of supplying Great Britain and the U.S.S.R. fell upon the U.S. and Canada. The total supply of butter entering world trade was estimated to be only about half the prewar average. Danish exports in 1945-46 were only about 180,000,000 lb; New Zealand's were 295,000,000 lb. and Australia's 112,000,000 lb. Supplies were reduced in all war-ravaged Europe as the number of cows was reduced about 25% and the demand for fats became extremely acute. In relief shipments, priority was given to dried and condensed milk over butter, which was not so easy to transport. Other fats were preferred to cream products.

Butter production continued to decline through 1945 and 1946, particularly in the U.S. The Canadian output also was reduced. Denmark and Switzerland alone had an increased milk production as feed supplies increased in 1946 and turned out more butter. The world's principal butter-producing countries in 1945 were: United States, 1,705,000,000 lb.; New Zealand 331,212,000 lb.; Australia 305,852,000 lb.; Canada 293,541,000 lb.; Denmark 291,667,000 lb.; Sweden 207,360,000 lb. All other countries produced less than 100,000,000 lb. Germany was in second place before World War II, producing an average of 792,000,000 lb. 1934–38.

The people in the U.S. drank much of their butter as fat in whole milk during the decade 1937–46. In other words, the great demand for whole milk absorbed much of the increased milk production, leaving less cream for buttermaking. This was not altogether a phenomenon of the war period; butter production had been declining after 1933. Production of farm butter for sale declined from 128,600,000 lb. in 1932 to less than 50,000,000 lb. in 1945, and creamery butter output did not make up the difference. Total U.S. butter production, farm and creamery, averaged 2,170,000,000 lb. during the period 1935–39. The output declined steadily to about 1,450,000,000 lb. in 1946 or to only 67% of the prewar average.

Production of Butter in the U.S., 1937-46

(In pounds)												
1937							2,170,000,000	1942				2,130,000,000
1938								1943				
1939								1944				
1940	٠						2,240,000,000	1945				1,705,000,000
1941							2,268,000,000	1946				1.450.000.000

The Dairy Products Marketing association, an organization of dairy co-operatives, was started in 1938 to support the butter market with government aid. At the outbreak of World War II in 1939, however, butter advanced in price rapidly and the association ceased operations. Stored stocks of butter reached a peak in 1938. Minimum prices for butter were announced by the U.S. government in 1941 and revised upward at various times

until Dec. 1944. At times during 1941 and 1942, prices of butter were below the minimum, and the government made heavy purchases to support the market. The minimum price in April 1941 was 31 cents per lb. at Chicago, Ill., which was raised to 36 cents in March 1942, and to 46 cents in November of the same year. During 1944 the price stood at 46 cents, and the government was pledged to hold the price at 90% of parity for two years following the official end of the war. The average price began to advance in early 1946 and stood at 50 cents when price control lapsed. The price rose to an average of 75 cents in December, then declined suddenly to about 65 cents per pound. The total payments in subsidies amounted to \$41,700,000 in 1943; \$79,900,000 in 1944; and \$55,600,000 in 1945.

The U.S. government reserved 30% of all butter produced after Feb. 1943, of which two-thirds was for the military forces. A large part of the remainder was sent to the U.S.S.R. The shortage of butter for civilians became so acute in Oct. 1943 that the government ceased buying until April 1944. Rationing was begun late in 1943 and checked civilian consumption. Stocks were reduced, and it was estimated that one-fifth of the 1944 production was taken for military and lend-lease uses. Per capita consumption of butter by civilians declined from 16.9 lb. in 1940 to 11 lb. in 1945. At the same time milk production was making a new high record. The increase was absorbed by the increased buying power of consumers as well as the changes in eating habits. Millions of workers were obliged to eat at lunch counters and found whole milk a cheap and convenient form of energy-giving food.

When rationing was terminated in Dec. 1945 and surplus U.S. government stocks were released, a temporary increase in civilian consumption followed, and per capita consumption rose to the prewar rate. Another butter shortage began early in 1946, however, and the total for 1946 was expected to be about the same 11 lb. per capita as in 1945. Creamery butter production in 1945 was the lowest after 1923. The shortage of butter was not caused by a decline in the dairy industry because milk production was high and prices paid dairy farmers for their products were above average in relation to feed costs. Only the shortage of labour and high wages handicapped dairymen.

The fresh milk supplies of the large cities were well maintained, and many communities with greatly increased populations of war workers were supplied by new dairy farms in the vicinity.

The prices of U.S. milk and cream for consumer use continued more favourable to dairymen than did the sale of cream for buttermaking, consequently the buttermaker was the last market to be supplied except in the season of flush milk production in the spring.

U.S. exports of butter had averaged only 1,579,000 lb. in 1931-40, but increased to 99,630,000 lb. in 1943 and then dropped to 32,873,000 lb. in 1945. Exports of natural butter amounted to about 18,000,000 lb., of which 16,400,000 lb. went to the U.S.S.R. Other exports included 4,200,000 lb. of butter oil and 10,800,000 lb. of butter spreads, of which about half went to the U.S.S.R. (See also Cheese; Dairying; Margarine; Milk; Vegetable Oils and Animal Fats.)

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Butyl Rubber

See Rubber.

Byelorussia

Also known as the White Russian Soviet Socialist Republic, Byelorussia is one of the 16 member states of the soviet union. It is inhabited by the Byelo-Russians or White Russians, a Slav people distinct from the Russians, and forming an ethnic bridge between Russians and Poles. According to the census of 1939, Byelorussia had a population of 5,567,976 on an area of 48,868 sq.mi. Capital: Minsk (pop. 238,772 in 1938); other important cities: (1939) Vitebsk (167,424) and Gomel (144,169). In 1939 the provinces of Poland, where White Russians lived, an area of more than 34,700 sq.mi. with a population of about 4,000,000, were added.

During World War II, White Russia was devastated. At the Yalta conference in Feb. 1945, Pres. Roosevelt agreed to the Russian demand that Byelorussia be recognized as having the status of an "independent" nation and that its delegates would be admitted to the United Nations conference at San Francisco. Byelorussia was represented at the conference by a delegation under Kuzma V. Kiselev, the people's commissar for foreign affairs.

(H. Ko.)

Byrd Antarctic Expeditions

See Exploration, Polar.

Byrnes, James Francis

Byrnes (1879—), U.S. statesman, lawyer and politician, was born May 2, 1879, in Charleston, S.C., of poor parents. At the age of 14, he left school to work in a law firm as office boy. Later, he became a court reporter. Elected on the Democratic ticket to the U.S. house of representatives, he was re-elected six times, serving from 1911 to 1925. In 1930, he was elected to the U.S. senate and was re-elected in 1936. A New Deal supporter, he was appointed to the supreme court bench in June 1941, but left in Oct. 1942 to head the newly-created Office of Economic Stabilization.

On May 28, 1943, he was appointed director of the Office of War Mobilization. In 1944, he ordered many drastic job controls to siphon off available manpower into war production. He attended the Yalta conference, Feb. 4–11, 1945. Two months later (April 2), he resigned as war mobilization director, asserting that victory in Europe was near and that his main task was completed.

Pres. Harry S. Truman named Byrnes secretary of state on June 30, 1945. Byrnes then accompanied the president to the Potsdam parley (July-August) and participated in the Allied council of foreign ministers (September-October). The latter parley ended in failure; Byrnes asserted that the deadlock resulted from Russian refusal to compromise on procedural matters. However, Big Three unity was recemented at the succeeding parley of British, U.S. and Russian foreign ministers at Moscow in December, where substantial agreement was reached on many issues. Byrnes declared, Dec. 27, that establishment of closer and more cordial relations between the Big Three powers was one of the important achievements of the Moscow conference. However, in early 1946, the administration shifted from what was termed a "soft" to a "hard" policy with regard to the soviet union. Byrnes apparently followed this new "line" at all the important diplomatic gatherings he attended in 1946, which included the U.N. security council sessions in London and New York, the Paris council of foreign ministers (Apr. 25-July 12), the 21 nations

peace conference in Paris (July 29—Oct. 15) and the New York conference of foreign ministers that opened Nov. 4, 1946.

The "hard" policy led to frequent clashes between Byrnes and the soviet delegates, with the latter insisting that the U.S. and Britain were aligned in a "western" bloc of nations and Byrnes denying the existence of such blocs. On several occasions, Pres. Truman reiterated his full approval of Byrnes policy, the first being March 28, 1946, when Truman endorsed his secretary's action in pressing the Iranian dispute in the United Nations. The second was on Sept. 14, when Secretary of Commerce Henry A. Wallace's attack on U.S. foreign policy jeopardized Byrnes' position. Truman then emphasized that there was "no change" in U.S. foreign policy. Following failure of the 21 nations peace conference in Paris, Byrnes asserted that the scant accomplishments were due to a soviet obsession that failure of the great powers to agree would result in inevitable armed conflict. Toward the close of 1946, Byrnes and Bevin signed (Dec. 2) a formal agreement providing for the economic merger of the U.S. and the British occupation zones in Germany.

CAA

See Civil Aeronautics Administration.

Cabbage

See VEGETABLES.

Cabinet Members, U.S.

Of President Roosevelt's ten original cabinet members appointed in 1933, all but two (William H. Woodin and George H. Dern) were still serving at the beginning of the decade 1937–46. During the course of the decade and until his death, Roosevelt appointed new secretaries of state, war, navy, agriculture and commerce, attorneysgeneral and postmasters-general. At the time of Roosevelt's death, only two of the original members, Harold L. Ickes and Frances Perkins, held their initial posts. The last, Ickes, remained until 1946, when he resigned.

Following is a list of cabinet members under the Roosevelt and Truman administrations, through 1946:

State.—Cordell Hull (1933–44); E. R. Stettinius, Jr. (1944–45); James F. Byrnes (appointed 1945).

War.—George H. Dern (1933–36); Harry H. Woodring (1936–40), Henry L. Stimson (1940–45); Robert P. Patterson (appointed 1945).

Treasury.—William H. Woodin (1933); Henry Morgenthau, Jr. (1934–45); Frederick M. Vinson (1945–46); John W. Snyder (appointed 1946).

Navy.—Claude A. Swanson (1933-40); Charles Edison (1940); Frank Knox (1940-44); James V. Forrestal (appointed 1944).

Attorney-General.—Homer S. Cummings (1933–39); Frank Murphy (1939–40); Robert H. Jackson (1940–41); Francis Biddle (1941–45); Thomas C. Clark (appointed 1945).

Postmaster-General.—James A. Farley (1933–40); Frank C. Walker (1940–45); Robert E. Hannegan (appointed 1945).

Interior.—Harold L. Ickes (1933–46); Julius A. Krug (appointed 1946).

Agriculture.—Henry A. Wallace (1933–40); Claude R. Wickard (1940–45); Clinton P. Anderson (appointed 1945). Commerce.—Daniel C: Roper (1933–38); Harry L. Hopkins (1938–40); Jesse H. Jones (1940–45); Henry A. Wal-

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lace (1945-46); W. Averell Harriman (appointed 1946). Labour.—Frances Perkins (1933-45); Lewis B. Schwellenbach (appointed 1945).

For British cabinet ministers and other members of the government at various intervals during the decade, see Government Departments and Bureaus; Parliament, Houses of.

Cacao

See Cocoa.

Cadmium

Data were lacking during the years of World War II for so many of the important cadmium-producing countries (Belgium, France, Germany, Italy, Norway, Poland, South-West Africa and Great Britain) that it was difficult to judge the trend of output. In 1937 these countries produced nearly one-third the total output. Among the producers for which data were available (Australia, Canada, Mexico and the United States) at the end of the decade 1937-46, output varied with local conditions, but in general increased appreciably. In Australia the 1937 output of 232 short tons dropped to 193 tons in 1939 and 1940, rose to 215 tons in 1941, dropped sharply to 177 tons in 1943 and rose to 284 tons in 1945. Canadian production was 375 tons in 1937 and 626 tons in 1941, declining to 274 tons in 1944, and recovering to 319 tons in 1945. In the U.S., where about one-quarter of the output continued to come from raw material imported from Mexico, production rose from 2,412 tons in 1937 to 4,192 tons in 1945, each year except 1938 showing an increase. The Mexican output remained all in the form of cadmiumbearing flue dust, practically all exported for treatment to the U.S. Production was not recorded and exports were somewhat irregular, depending on current demand; exports varied between a low of 684 tons in 1937 and a high of 1,160 tons in 1945.

Cadmium consumption in the U.S. increased from 3,089 tons in 1940 to about 3,850 tons in 1941 and 1942, and to a high of 4,433 tons in 1944, before dropping back to about the 1942 level in 1945. Although there was some variation from year to year depending on current demand in other lines, about 70% of the total was used in electroplated rustproof coatings, much of which was applied to war material. Unspecified uses in 1944 called for 975 tons and in 1945 for 150 tons, some of which was possibly used in the plants producing plutonium for atomic bombs.

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Cadogan, Sir Alexander George Montagu

Sir Alexander Cadogan (1884—), British diplomat and statesman, was born Nov. 25, 1884, youngest son of the 5th earl of Cadogan. He was educated at Eton and Oxford university and later entered Britain's diplomatic service. He held a number of minor posts in British embassies up to and during World War I. He was made a foreign office counsellor in 1928 and was knighted in 1934. From 1933 to 1935, he was envoy extraordinary and minister plenipotentiary to China and in 1935, when the Chinese legation was raised to the status of an embassy, Sir Alexander became the British ambassador to China.

He was recalled to London in 1936 to become deputy undersecretary of state for foreign affairs, and in 1938 he succeeded Sir Robert Vansittart as permanent secretary. During World War II, he accompanied Churchill, Eden and other British cabinet members to various conferences with other Allied leaders. With Sumner Welles (then U.S. undersecretary of state), Cadogan drafted the Atlantic Charter in the summer of 1941.

In 1944, Sir Alexander headed the British delegation to the Dumbarton Oaks conference. He attended the United Nations conferences in San Francisco in 1945 and on Jan. 31, 1946, the British government announced that he had been chosen permanent British representative on the U.N. security council.

Caggiano, Antonio

Cardinal Caggiano (1889—), Argentine prelate, was born Jan. 30, 1889, at Coronda, Santa Fé province, Argentina. Educated at the Colegio de la Immaculada and Santa Fé seminary, he also studied at the Latin-American Pian college at Rome and was ordained to the priesthood in 1912. He was named bishop of Rosario in 1935 and then taught philosophy and science at the Santa Fé seminary. He later returned to Rome, studied the organization procedures of the Catholic Action and was appointed general ecclesiastical counsellor of the Argentine Catholic Action. Caggiano was largely instrumental in fostering the growth of Catholic Action in Argentina, Uruguay and Paraguay. He was created a cardinal at the consistory ceremonies in Vatican City, Feb. 18, 1946.

Cairo Conference (1943)

See International Conferences, Allied (World War II).

Calcutta

The affairs of Calcutta-second largest city in the British empire-continued to be managed by a corporation consisting of a mayor, a deputy mayor, an executive officer, 5 aldermen and 80 councillors, with elections triennial. Not only in the matter of increase in the number of elected representatives was the constitution made more democratic, but the franchise also was lowered, women made eligible for election, and special representation was afforded for Mohammedans, the scheduled classes, Anglo-Indians and Labour. Voting continued to be by ballot. Special powers were given to the corporation for maintaining municipal cowsheds and improving the milk supply. The law relating to food and drugs was made more explicit. Licensed building surveyors were appointed, and power was given to the corporation to refuse to sanction building plans unless prepared by a licensed surveyor. The improvement trust was responsible for opening up congested areas, laying out streets and providing open spaces. The port trust of 20 members managed all matters relating to shipping.

The population of Calcutta, estimated in 1937 at 1,485,500, was 2,108,891 at the 1941 census. Until the closing of the schools because of air raid threats in 1942, the corporation maintained 234 free primary schools, including 5 night schools for carters and sweepers. There were 20 free hospitals and dispensaries. The birth and death rate, 10.5 and 27.7 per 1,000 respectively, were exceptionally low for India. The most comprehensive engineering scheme of the decade was the Kulti outfall drainage scheme, which was by 1946 practically complete.

The declaration of war by Japan and the advance of the Japanese to the Assam border brought Calcutta into the front line. The city was an advanced base for supplies going to the front; it was crowded with U.S., British and Indian troops, and during the retreat from Burma, with multi-

tudes of refugees who had evacuated the country and arrived destitute and in a pitiable condition. Voluntary societies, largely run by British and Indian women, worked indefatigably to cope with the situation. The threat of bombing necessitated the raising of A.R.P. services and the erection of shelters. Calcutta had its first air raid on Dec. 20, 1942, and another on Jan. 6, 1943, when three planes were brought down. After this there was no raid for nearly a year. Casualties were light and there was no panic.

In Dec. 1942, owing to the disastrous Bengal famine, starving peasants started to arrive in the city in large numbers, and strenuous efforts were necessary to avoid the outbreak of an epidemic. Free kitchens and dispensaries were opened, and camps were erected outside the city, but the mortality was very high and the hospitals were overflowing. The famine was checked after the personal intervention of the viceroy, Lord Wavell, with the co-operation of the military authorities. Calcutta suffered heavily during the communal rioting following the declaration of "direct action day" by the Moslem league on Aug. 6, 1946. There were many casualties and the destruction of property was extensive. Many shops were looted, and tramcars and omnibuses were set on fire.

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Calendar of Events, 1937-46

See Chronology of Events, 1937-46.

California

The most southerly of the Pacific coast states, popularly known as the "Golden State," California was the 31st to enter the union (Sept. 9, 1850). Area: 158,693 sq.mi., of which 1,890 sq.mi. is water. Pop. (1945 estimate) 8,842,700; in the 1940 census it was 6,907,387. Capital, Sacramento (105,958). Other cities: Los Angeles (1,504,277); San Francisco (634,536); Oakland (302,163); San Diego (203,341); Long Beach (164,271); Berkeley (85,547); Glendale (82,582); Pasadena (81,864). All these cities had large increases in population during World War II.

Important legislative acts during 1937 provided for liberalization of the old-age pension law, substitution of lethal gas for hanging as a means of capital punishment, and establishment of a retirement system for judges. In a special election, Albert J. Elliott was elected to succeed Henry Stubbs as representative of the 10th congressional district. An important development in municipal politics was the election of Frank L. Shaw to the Los Angeles mayoralty. A year-long graft investigation in San Francisco resulted in the resignation of all members of the police commission and ousting of many police officers.

Widespread labour unrest severely handicapped California industry during 1937. Most protracted and costly was the strike of 40,000 San Francisco maritime workers, which tied up shipping for 98 days. Violence and bloodshed marked a strike in the canning industry which was ended in November by an agreement involving 96 canneries and unions representing 70,000 workers. Important strikes also affected San Francisco hotels, the motion picture and automobile industries and certain aircraft factories. Inter-union controversy, affecting the entire Pacific coast area, reflected labour unrest during the latter half of the year.

A reaction against the conservative administration of Governor Frank F. Merriam (Rep.) swept left-wing Demo-

crats into the major state offices in the 1938 elections. Bidding for the liberal vote by promises of a pardon for Thomas J. Mooney and a self-help, co-operative program for unemployment relief, Culbert L. Olson decisively defeated Merriam, to become California's first successful Democratic gubernatorial candidate in 44 years. For U.S. senator, Sheridan Downey, running mate of Upton Sinclair in the 1934 EPIC (End Poverty in California) campaign, won the Democratic nomination from the Roosevelt-endorsed incumbent and scored an impressive victory over the Republican nominee. The Democrats maintained their majority in the state legislature's assembly, the Republicans theirs in the senate. The pension plan, which gained nation-wide notoriety as the "Ham and Eggs for California" program, and bills seeking to restrict labour activities and institute the "single tax" were defeated.

In Los Angeles, a reform party succeeded in ousting Mayor L. Shaw in a special election held in Sept. 1938. Many changes in city personnel were instituted by Shaw's successor, Fletcher Bowron. Labour strife was less extensive, although San Francisco warehouses and department stores were involved in serious labour controversies.

Throughout a record-breaking session of 133 days in 1939, the legislature consistently opposed the liberal program of Governor Culbert L. Olson. Olson's budget was reduced by some \$91,000,000, although the final amount, \$468,071,624 for the 1939–41 biennium, was still the largest budget in state history. Despite the mounting deficit, the legislature also rejected the governor's entire tax program, except for a tax on gifts.

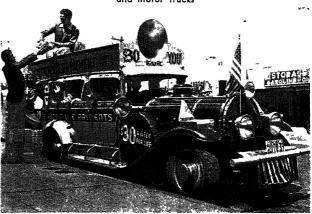
In a special election in November the "Thirty Dollars Every Thursday" pension scheme was repudiated by the voters.

Labour disturbances continued in the maritime industry in 1939, particularly in San Francisco, and in November culminated in a general longshoremen's strike which lasted for 53 days. Deportation hearings in the Harry Bridges case and the pardon of Thomas J. Mooney were other events on the labour front.

The legislature convened for five special sessions in 1940, primarily to consider additional relief measures. A bill excluding Communist party candidates from the state ballot was also approved by both the legislature and Governor Olson.

Three state-wide elections were held in 1940. The thirdterm issue split Democratic ranks in the presidential pri-

"Thirty Dollars Every Thursday," the slogan of an old-age pension plan rejected by voters of California Nov. 8, 1938. Campaigning by many hundreds of workers was carried on from public platforms and motor trucks



maries, with the Olson-sponsored Roosevelt delegation winning over three other groups. In the November general election the state cast a record vote of 3,300,410 distributed as follows: Roosevelt, 1,877,618; Willkie, 1,351,419; Thomas, 16,506; Browder, 13,586; Babson, 9,400. In the U.S. senatorial election the figures were: Hiram Johnson, 2,238,899; Fred Dyster (Prohibition), 366,044; Anita Whitney (Communist), 97,478; scattering, 11,439. Eleven Democrats and nine Republicans were elected to congress.

Under the stimulus of the national defense program, unprecedented industrial expansion took place in the state during 1941. National defense highlighted the regular session of the legislature, which created a 30-man council to co-ordinate defense preparations of state and local government, approved legislation penalizing sabotage and subversive activities, and established a program designed to forestall disruption of economy by labour disturbances. An act outlawing secondary boycotts was passed over the veto of Gov. Olson. A special session called to finance defense preparations granted only \$1,000,000 of the \$10,000.000 requested for the governor's emergency fund, but appointed a committee to study defense needs in preparation for further appropriations. (C. E. Ch.; R. H. Sh.; X.)

A Japanese submarine shelled oil fields at Ellwood on Feb. 23, 1942, and blackouts in coastal cities took place on several occasions. All Japanese (approx. 95,000) were ordered removed from the coastal zone by the commander of the western defense area. Other defense measures included dimming of lights visible at sea and a general dimout within a 50-mi. wide zone along the coast.

In the general election in Nov. 1942, Governor Olson lost to Earl Warren (Rep.) in an election in which 2,264,288 votes were cast. The lieutenant governor and secretary of state chosen were both Republicans. The Republicans also won a majority in both houses of the legislature. The electors approved an anti-hot cargo initiative measure, and defeated a proposal to repeal the state income tax.

Governor Warren's program included a tax reduction, a state guard program which abolished the militia plan in force, formation of a state war council representing the state, city and county governments, a postwar planning council to cope with the postwar unemployment problem, and a food and fibre council, created to meet agricultural problems. Clashes between service men and so-called "zoot suit" gangs in Los Angeles and riots at the Japanese relocation camp at Tulelake were two incidents related to war conditions during 1943. California was the leading state in ship and plane production (9.9% of the total output). On Aug. 16, 1943, the state's first steel mill (erected by Henry Kaiser at Fontana) started operation.

In 1944, Gov. Earl Warren delivered the keynote speech at the Republican National convention in Chicago in July, and was mentioned as a possible vice presidential candidate. In the national election in November, Roosevelt received a vote of 1,988,564 as against 1,512,965 for Dewey. In the senatorial race, Downey, the incumbent, won over Republican Frederick Houser. In a special session in January the legislature enacted a measure combining.

State expenditure . . . Number of banks . . .

Number of national banks

bining August and May primary elections for the war period, established a new administrative system for state penal institutions and authorized taxation of federally-owned property whenever consent should be given by the national government. A later session considered a teacher's retirement act and additions to the program planned to meet postwar unemployment.

In Dec. 1944, the war department authorized the return of loyal U.S. citizens of Japanese ancestry to the coast. An explosion of ammunition vessels at Port Chicago in July cost the lives of 321 persons and extensive property damage. The state continued as a heavy producer of ships and planes and remained in the "No. 1 critical" classification under manpower regulations.

In May and June 1945, attention was focused upon San Francisco when United Nations delegates met there to plan for a permanent world organization. On June 19 the legislature ended the longest session in its history. A war council created to deal with invasion emergencies was abolished and its responsibilities assigned to a disaster council, and a war catastrophe fund of \$25,000,000 was unfrozen for other uses. Unemployment insurance provisions were liberalized, a committee was set up to study a plan for prepaid medical care through a system of compulsory health insurance, \$15,000,000 was voted for improvement and maintenance of state park and beach facilities, salaries of state employees were increased, tax reductions established in 1943 were continued, and the exemption base for income tax was broadened.

The housing situation became more acute as the war shifted to the Pacific and was heightened after its termination because west coast ports became congested with returning servicemen and their families. Some industries were affected by labour unrest, with the greatest publicity being given to strikes in the movie industry. The return of Japanese residents, after restrictions were lifted in Dec. 1944, was marked by violence, and the opposition to their return was such that many preferred to settle elsewhere.

Governor Earl Warren was re-elected in 1946 in a victory that indicated the state's return to its traditional

California: Statistical Data Table I.—Education (Public)

	1936	1938	1940–41 (av.)	1943-45 (av.)
Elementary pupils	830,136 310,291	852,481 \ 342,543 \	998,836	689,876 348,371
Elementary school teachers			43,200	•

Table II.—Public Welfare (All money figures in thousands of dollars)

	1937	1938	1939	1940	1941
Cases on general relief Cost of general relief. Recipients of old-age	97,211 \$2,826	107,091 \$3,231	123,127 \$3,101	112,322 \$3,186	62,140 \$1,453
pensions		125,270 \$4,063		141,792 \$5,382	156,329 \$5,909
receiving aid Blind receiving aid		31,692 6,159		37,723 7,161	37,81 <i>5</i> 7,290
ment compensation .		1,700,000	1,286,868	1,305,600	

Table III.—Communications (Money figures in thousands of dollars)

Table IV.—Banking and Finance

(All money figures in thousands of dollars)

1 <i>937</i>	1938	1939	1940	1941	1942
\$287,538 \$232,402	\$353,488 \$300,399	\$372,070 \$293,753	\$330,848	\$368,687	\$345,443
238 \$3,888,100	232 \$3,976,400	229	227	225	
103	102	\$4,132,700 100	\$4,408,400 98	\$4,651,386 96	\$5,279,200
\$2,835,426	\$2,912,235	\$3,034,183	\$3,333,500		

Table V.—Agriculture (All figures in thousands)										
1937 1938 1939 1940 1941										
Total acreage, principal		.,,,,	,,,,	.,40	.,					
crops	5,722	5,407	5,45 5	5,755	5,832					
Income, crops and										
livestock	\$681,100	\$514,700	\$595,474	\$636,208						
Income, govt. payments .	\$ 6,000	\$ 12,300	\$ 19,384	\$ 21,840						
Farm value of crops	\$440,683	\$341,874	\$383 <i>,775</i>	\$405,340						
Leading crops (bu.).	00.050	07.550	00.050		0.5.500					
Barley	28,350	27,550	30,850	33,516	25,529					
Corn	2,108	2,077	2,040	2,240	0047					
Flaxseed	660	684	1,728	2,814	3,267					
Grapes (short tons) .	2,454	2,531	2,228	2,246	2,411					
Hay	4,127	4,352	4,184	4,657	4,588					
Hops	10,598	9,1 <i>5</i> 2 3,388	10,868	10,080						
Oats	3,080 45,914	41,420	3,944 44,404	4,350	47.004					
Oranges (boxes) Peaches	23,252	20,835	24,293	45,340 23,585	47,284 22,252					
Potatoes	18.156	19,800	22,648	22,740	20,951					
Rice	9,108	9,100	9,000	8,968	9,180					
Sorghum, grain	4,060	4,495	2,943	4,704	7,020					
Sugar beets (short tons)	1,731	2,129	2,707	2,803	7,020					
Wheat	17,888	12,733	12,173	11,370	11,656					
,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	.,,000	,, 00	,,,,	,0, 0	,550					

Table VI.—Manufacturing (All money figures in thousands of dollars)

 Wage earners
 1937
 1939
 1942
 1943
 1944

 Wages paid
 302,189
 275,477
 608,000
 1,138,000
 820,800

 Wages paid
 \$389,132
 \$365,114

 Value of products
 \$2,899,865
 \$2,798,180

Table VII.—Mineral Production (All figures in thousands)

Republican affiliation. At the start of the campaign, both Warren and his Democratic opponent, state Atty. Gen. Robert W. Kenny, declared themselves bipartisan liberals, and each took advantage of the state's law to cross-file in the opposite party. Warren had the support of the American Federation of Labor, while Kenny had the backing of the Congress of Industrial Organizations' Political Action committee. In the June primaries the governor won about 90% of the Republican vote and approximately 55% of the Democratic vote, and thus became the first executive in the history of the state to win both the Republican and Democratic nominations. Will Rogers, Jr., was chosen over Rep. Ellis Patterson to be the Democratic nominee for the U.S. senate. As a result of the governor's victory in the primary, interest in the pre-election race centred on the contest between Will Rogers, Jr., and the incumbent senator, William F. Knowland. The November elections found the Republican candidates victorious, Knowland defeating Rogers by around 900,000 votes.

A number of state propositions came up for consideration at the election. Californians voted to float a bond issue for \$100,000,000 to help veterans get homes and farms but turned down a proposal to make business loans to veterans. A state-wide minimum of \$2,400 per year for teachers' salaries was approved. A law to legalize dog racing and betting thereon was voted down, as was a Fair Employment Practices commission which would have tried employers suspected of discriminating against employees because of race, religion, colour, or ancestry.

Disputes between labour and management and jurisdictional disagreements between various labour factions slowed the return to peacetime activities in 1946. A mass strike of 100,000 A.F. of L. labourers tied up business in Oakland for three days, while a jurisdictional labour dispute at seven of the major Hollywood movie studios led to

violence between pickets and nonstrikers. As part of a nation-wide movement, west coast shipping was tied up twice during the year while operators and union officials sought to break wage-increase stalemates.

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Camacho, Manuel Avila

See Avila Camacho, Manuel.

Camara, João de Barros

See Barros Camara, João de.

Cambodia

See French Colonial Empire.

Cambridge University

See EDUCATION.

Cameroons

See British West Africa; French Colonal Empire; Mandates.

Camouflage

Until World War II, camouflage was rather generally planned and executed from the standpoint of ground attack. While the aeroplane was a factor in World War I, it was not as pronounced in importance as in the later conflict. About 500 B.C., Sun-tzu urged recognition of the art of deception as all important in the art of war; the troops of Genghis Khan trimmed their helmets with leaves and twigs; the Thebans, in the time of Xenophon, outnumbered by the Spartans, sent out a cavalry detachment to mill around and stir up a dust cloud under whose protective concealment they advanced, caught the enemy unprepared and routed him; in 1770, Charles XII burned brush to make a smoke screen, crossed a river under its canopy and defeated the Saxons; in colonial United States, General Braddock refused to recognize the need for camouflage with the result that his bright red-coated troops were decimated by troops who were nearly invisible because they blended with the natural background.

World War II camousleurs had very definitely to deal with aerial photography in planning and executing camouslage. The stereoscopic camera took pictures in three dimensions; the infra-red ray photograph immediately spotted faulty coloration in relation to natural vegetation. Both of these agencies were hard to fool. Nevertheless, World War II camousleurs did a good job. Net camouslage transformed trucks, tractors and tanks into prosaic, "harmless" haystacks. With slight variation, netting formed "flat tops" to screen anti-aircraft guns emplaced for firing. Frequently, garnished chicken wire was substituted for netting.

Soldiers were dressed in dapple-painted clothing and trimmed themselves with surrounding foliage. In the tropics, vivid colours predominated in camouflage colouring; in the north, white predominated. Invariably, the effort was to fuse with the landscape so that, except where natural surroundings were particularly vivid, paint tones were mostly neutral. Battleships, trucks, tanks, jeeps or landing barges were usually painted haze-gray because of its great disappearance value.

By using "flat top" camouflage, great industrial factories

were made to disappear. What really were roof tops and smokestacks appeared to the spying aviator as farm landscapes with their familiar barns, silos and rambling country roads. In the south of England this trick was reversed, and a sprawling industrial city was built of flimsy camouflage materials-electrically controlled, it flared into smoking stacks and flaming forge fires of seeming munitions production. Repeatedly, the Germans were taken in by the ruse and wasted thousands of tons of bombs on a cardboard industrial "giant." In the battlefield, many dummy installations were set up so that they might draw bombing and create confusion concerning real strength and intentions. The Japanese employed shadow painting in the Pacific islands to make the Allies waste bombs. Plane silhouettes were painted on the white coral beaches as plainly seen targets. When the British were hammering at Berlin with their night-raiding planes they encountered what registered as anti-aircraft batteries and air fields around the city. Actually, nine such seeming targets were dummy installations.

The Allies, through co-operation of U.S. and British engineers, led in the production of dummy targets. Tanks, trucks and cannon appeared on roads and fields as fast as they could be inflated from compressed air tanks. Germans wasted many shells on these rubber dummies. The

same was true of aeroplanes seemingly parked and awaiting destruction. U.S. engineers built these dummies to allow easy and rapid handling, prefabricated from wire, target cloth and wood. They were so constructed that an entire squadron of 24 dummy fighters could be built by 30 trained men in two weeks, along with the mock air base paraphernalia to make the ruse complete.

The camoufleur of World War II recognized that an object would be revealed by (1) its modelling and shadow, (2) its outline, (3) its tone, (4) its colour. One of the most important things he had to reckon with was the texture of the surface he presented. If glossy, light was reflected as from the facets of a diamond; if mat, light would be dispersed without concentration on any single object. Shadows bulked large in the engineer's problems. This rule applied: "Use the shady side of big things; sunny side of little things." Truck trains parked on an open road took the side of the road away from the sun or moon. Windshield and headlights were covered to eliminate reflecting surfaces. Here again nature taught the lesson. Creatures which must hide to survive have no reflecting surfaces; they are covered with furs or feathers. Those which already live in a mirror, fish, have shiny bodies. The problem of disrupting outline was met as in

White uniforms provided excellent winter camouflage for troops in World War II. This picture shows members of a Scottish regiment on patrol duty at the Zetten front in the Netherlands early in 1945, with rifles in ready position



nature by use of the fringe pattern. A butterfly's wing markings show "eyes" which are far removed from the real eyes in his body—so, in camouflage, outlines were fringed so as to lead bombing away from vital centres.

One basic formula obtained for all camouflage, either fuse the object with its immediate natural surroundings or bury it out of sight.

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Camp Fire Girls

See Societies and Associations.

Canada

A North American dominion of the British commonwealth, Canada is a federal union of nine provinces brought together under the British North America act, 1867. Area: 3,694,863 sq.mi.; pop. (1941 census) 11,506,655. Capital: Ottawa (154,951). Largest cities: Montreal (903,007); Toronto (667,457); Vancouver (275,353); Winnipeg (221,960), Hamilton (166,337); Quebec (150,757).

In the federal election of 1935, the Liberals under Prime Minister W. L. Mackenzie King, who had been in office with a short interregnum from 1921 to 1930, were returned with 174 seats out of 245. The opposition was composed of 38 Conservatives under R. B. Bennett (prime minister, 1930-35), an exceptionally able man who lacked first class lieutenants, and the Canadian Commonwealth Federation (C.C.F.), a party with socialist leanings under J. S. Woodsworth, who was highly respected but somewhat lacking in driving power. Because of Canada's relative helplessness in stemming the world-wide deflation, the division of jurisdiction between dominion and provinces, and its own vacillation, the King government failed to give the nation a strong lead in pulling it out of the depression. To be sure, it made trade agreements with Britain and the United States, planned Trans-Canada Air Lines, studied the St. Lawrence waterway, helped housing, reorganized the reserve army which since 1918 had existed chiefly on paper, increased spending on national defense, and failed to condemn appearement in Europe. Yet on the whole it lacked vigour.

In all the nine provinces the Liberal party was in power except in Alberta (Social Credit) and Quebec (Union Nationale). In the former, attempts at monetary reform were hamstrung by constitutional difficulties. In the latter, the policies of Premier Maurice Duplessis expressed the deep lying strains in the social, political and religious life of a people with a rural background slowly becoming urbanized and industrialized. Duplessis fixed minimum wages, made loans to farmers and increased the representation of the English-speaking minority in the cabinet. He gave the Catholic Church a more prominent position in official ceremonies and curbed itinerant anti-Catholic preachers. Finally, though asserting that he would not permit a totalitarian state in Quebec and that minority rights would not be interfered with so long as they did not weaken the autonomy of French-Catholic Canada, Duplessis seized the literature and forbade meetings of various leftist groups. The enforcement of this "padlock law" put the Ottawa government in a quandary especially after it had disallowed Alberta's Social Credit legislation.

In Ontario Premier M. F. Hepburn began a long feud with the dominion prime minister. Personal relations had been strained for some time, but the unwillingness of Ottawa Liberals to deal with the railway problem to Hepburn's satisfaction and their reluctance in backing him up in his fight against industrial unionism touched off an intermittent quarrel which eventually made impossible a speedy solution to the urgent problem of dominion-provincial relations. Yet even in the face of this internecine wrangling and of the opposition of financial interests to the repudiation of the power contracts, the Liberals under Hepburn were returned to power in 1937.

In 1938 Bennett resigned leadership of the Conservatives to retire to England where, later, he accepted a viscounty and membership in the house of lords. He was replaced by Dr. R. J. Manion, an Irish-Catholic who was expected to capture seats in Quebec, where his party had made a poor showing ever since it had tried to introduce conscription in 1917. Manion was a moderate protectionist in a traditionally high tariff party, and a relatively lukewarm imperialist for a group which included all those Canadians who without questioning accepted British foreign policy.

French-Canada and Solidarity.—The outbreak of World War II at once made Canadians apprehensive about national unity. In World War I, the vast majority of French-Canadians had refused to enlist voluntarily and in some cities rioted against the attempted enforcement of conscription. French-speaking Canadians, though a minority, were neither small in numbers nor isolated in position. They comprised about one-third of Canada's population and, while dominating Quebec, had important blocs in other provinces as well. They were thrifty, industrious and deeply religious. Their educational and philosophical background emphasized love of family, race and church rather than science and the industrial arts. In consequence, they controlled few important Canadian banking, trading and manufacturing establishments even in Quebec. Hence they had developed an economic inferiority complex. Also they feared that urbanization and modern skepticism might weaken their church and accordingly they had become traditionalists in many of their attitudes. Their motto, officially and in many senses practically, was still 1e me souviens. They were the descendants of sturdy souls who came to Canada before 1700. They felt that France abandoned them militarily during the Seven Years War and left them stranded in a cultural sense by the anticlericalism of the early 20th century. They still had a deep feeling of loyalty to the crown, an outgrowth of their own royalist traditions, but relatively little for the British people because of the lack of blood relationship, a potent factor in their own closely-knit family life. French-Canadians could see no sense in spilling their blood in wars which seemed to have but a remote connection with their own ancestral acres. Their primary loyalty was toward Canada and to Canada alone. They called themselves les Canadiens.

It was against this background that the controversy over conscription and the danger to national unity during World War II had to be placed. In the interwar period, French-Canada had been assured again and again by politicians of all parties that conscription for overseas service would never be adopted. At the same time their leaders asserted that they would fight to the last man in defense of Canada, their patrie, in case it were attacked. It was with this tacit understanding that Canada, of its own

volition and with only a few scattered dissenting voices, declared war.

The feeling of national solidarity was deepened in a spectacular manner by the results of an election in Quebec in Oct. 1939. Premier Duplessis had taken issue with the dominion's authority to impose certain war measures on Quebec although, he declared later, he was not opposed to Canadian participation in the war provided the rights of his province were not impaired. In effect, however, here was an open challenge to the dominion government. Ernest Lapointe, the acknowledged leader of the federal Frenchspeaking Liberals and in practice associate prime minister, along with the other cabinet ministers representing Quebec in Ottawa, campaigned against Duplessis, who was decisively defeated by the Liberals. The result gave deep satisfaction to the English-speaking provinces though, as later events proved, it indicated the French-Canadian desire for national unity rather than willingness to serve in the armed forces.

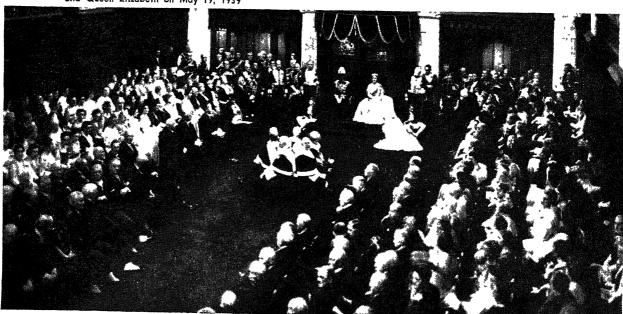
Election of 1940.—In Jan. 1940, Prime Minister King had the house of commons dissolved after a session lasting less than five hours. He argued that a prolonged and unpleasant parliamentary controversy would serve no useful purpose and would lend aid and comfort to the axis. The opposition condemned the action, legal though it undoubtedly was, as pusillanimous and incompatible with the democratic right to criticize government policy. In the ensuing election Dr. Manion was handicapped by his inability to rebuild his party on short notice, his own injudicious statements, his demand made without official party approval for a national government representing all parties, and by the impossibility of reviving the conscription issue in Ontario without losing votes in Quebec. The C.C.F. suffered from the general disillusionment with the then current policy of soviet Russia which many people, rightly or wrongly, associated with left wing groups, and from the party's stand that Canada could contribute more to defeating naziism by sending goods than men, a stand which seemed like trying to escape the legitimate moral obligations of a belligerent. The King government was

Canadian parliament at Ottawa during the visit of King George and Queen Elizabeth on May 19, 1939

returned with 184 seats, 8 more than at dissolution, while the opposition was meagre in ability and divided among Conservatives, C.C.F. and Social Credit.

The fall of France led to a vociferous demand among English-speaking Canadians for a more aggressive war program. Among French-Canadians, if any antiwar sentiment lingered, it now found no overt expression. When disaster struck their mother country, les Canadiens realized that France really meant a good deal to them and that they were now the sole bastion of French culture among the democratic nations. They still displayed little ardent enthusiasm for overseas active service, but they accepted higher taxes and wartime controls with none of the intransigeance of 1917. The government speeded up its munitions production. It accelerated the British Commonwealth Air Training plan. It expanded the Canadian navy many-fold beyond its prewar size. Taxes were stepped up sharply, and the machinery for controlling prices and the supplies of scarce goods was strengthened. The cabinet was reorganized but King, though rejecting the proposal for a government of all parties, was unsuccessful in inducing prominent Conservatives outside parliament to accept office in it. Finally, men were conscripted under the National Resources Mobilization act for home defense. Service outside Canada remained on a voluntary basis. Both the navy and the air force were flooded with recruits, but army enlistments were slower. Calling up men on this plan of limited conscription did not lead to a single disturbance among French-Canadians though a few trouble makers had to be interned. Of course there were wide differences of opinion throughout Canada on specific policies, on the vigour, or scarcity of it, with which King conducted affairs, and also on the apparent lack of a general plan, an overall pattern, to integrate the zealous efforts of individuals and organizations. Nevertheless no one in the interwar period would have thought it possible for the dominion to make such a large and constantly growing contribution to the war effort with so little political acrimony and so few signs of national disunity.

From the 1940 election to early in 1942, Canadian politics were concerned with a variety of topics. The dominion-provincial conference of 1941 came to an almost ignominious conclusion. Prices and wages were frozen; wartime agricultural policy was hammered out over the objections



of some farmers' organizations; the Hyde Park agreement between King and President Roosevelt early in 1942 eased the foreign exchange problem; war plants and shipyards turned out tons of war supplies and ships; enlistments kept up with the demands of the forces. Dr. Manion, who resigned, was followed as Conservative leader by Senator Arthur Meighen, who had been prime minister for short terms in 1919–21 and 1926. An experienced parliamentarian of great intellectual powers and forensic gifts, Meighen represented the more imperialistic and less socially minded group within his party. In particular he took up the demand of conscription for overseas service, a cause which he had championed in 1917 but rejected in the interwar period.

The Conscription Issue.-Meighen and his fellow conscriptionists, chiefly in Toronto and on the Pacific coast, argued that if the case for full compulsory service were clearly and fairly explained to French-Canadians, who had already accepted limited conscription, all but a small minority of extremists would acquiesce in it, if without enthusiasm, then at least with a feeling of resignation to an unfortunate and bitter necessity. He declared too that the danger of national disunity was a bogy manufactured by Liberal politicians for partisan ends and that the dual system of recruiting (voluntary for overseas, compulsory for home defense), besides being wasteful, would leave a calamitous legacy among young men, some of whom would regard the others as shirkers. On the contrary, Liberals contended that overseas' conscription would be the end of confederation, and that the experience with conscription in 1917 had shown conclusively that the numbers obtained were incommensurate with the trouble and expense involved. Nevertheless as a concession to conscriptionist sentiment, the government adopted an unusual course. Perhaps also it hoped that such an overwhelming majority of Canadians would favour conscription that French-Canadians would make no effort to prevent the will of the majority being carried out. In any case, in April 1942, it held a plebiscite asking that it be relieved of the promise which it gave—as did the opposition parties—prior to the general election of 1940 and before the fall of France, that it would never introduce conscription. The government, including ministers from Quebec, the other parties and the English-language press were unanimous in asking release from the promise. This was granted by a vote of 70% for the country as a whole, a majority of four to one in eight provinces but rejected by three to one in Quebec. Clearly French-Canadian opposition to compulsory overseas service had not softened as much as many of the conscriptionists had assumed. On the other hand, the vote indicated that conscription was not the demand of a few imperialist die-hards. For the time being, however, there was no change in the two-army policy. Later King epitomized his policy in the statement "not necessarily conscription but conscription if necessary." The defeat of Meighen when he attempted to get a seat in the house of commons gave the entire issue a temporary quietus.

Period of Quiet.—From mid-1942 to late 1944, dominion politics were relatively tranquil though a new party, Le Bloc Populaire, openly campaigned for a limited war effort. Hepburn, the colourful contradictory premier of Ontario, resigned to be followed by two other Liberals and then (1943) by Col. G. A. Drew, an imperialistic Conservative, whose hold on power was precarious until another election (1945) consolidated his position. A Conservative convention selected as national leader John Bracken, who had been premier of Manitoba since 1922. A sincere man with a firm grasp of agricultural problems, Bracken lacked ex-

perience in many national affairs and was deficient in dynamic qualities. A Liberal at least as late as 1935, he was chosen because he seemed to offer the Conservatives better hope of election than any orthodox party member.

In 1944, the C.C.F. won the provincial election in Saskatchewan, thus for the first time capturing major office. Many C.C.F. votes were cast by those who, for one reason or another, had become disgruntled with the older parties, but the core of the new group was Fabian Socialist. It emphasized social legislation and state ownership of industries that were strongly affected with a public interest or showed monopolistic tendencies. It insisted, however, that most lines of activity, especially those (including agriculture) in which small enterprises flourished would remain indefinitely under private ownership. It emphasized equality of economic and social opportunity without regard to sex, race or religion. It was critical of overseas entanglements because it felt that wars were synonymous with capitalism. Its immediate program in Saskatchewan included better health services, higher pay for teachers, automatic postponement of farm debt if returns per acre were low, collective bargaining with the closed shop, and nationalization of industries beginning with highway transport, cloth and footwear manufacture. Besides victory in Saskatchewan, the C.C.F. during the years 1937-46 became the second largest party in the legislatures of Ontario and Alberta. In British Columbia the Liberals and Conservatives formed a coalition to keep them out of office. Duplessis, still a vigorous provincial autonomist but less critical of the war effort than formerly, was returned in Quebec. The Maritime provinces and Manitoba remained in the Liberal fold throughout the ten-year period.

Again, Conscription.—Late in 1944, dominion politics suddenly became inflamed with passion to a degree rarely equalled. After a visit to the fighting fronts, Col. James L. Ralston, minister of national defense became convinced that Canada could not continue to provide the necessary replacements in its army overseas by voluntary enlistments alone. When he could not persuade Prime Minister King of the alleged necessity for overseas conscription, he resigned and Gen. A. G. L. McNaughton, former commander of the Canadian corps, was appointed in his stead. A month later, King reversed his previous position and ordered overseas 16,000 men from those who had enlisted for service in Canada only, whereupon the popular and able associate minister of national defense who represented a Quebec constituency left the cabinet. All the arguments for and against conscription were gone over again with growing violence of expression on both sides. It appeared that the government had fallen between two stools, losing support among the English-speaking population and failing to retain any in Quebec. Both King and Gen. Mc-Naughton were the recipients of a good deal of personal abuse particularly by the conscriptionists. Some army officers who, contrary to regulations, expressed their political opinions to the press were threatened with court martial. A few home defense troops were insubordinate for a short time, but the conscripts who were actually sent overseas carried out their duties effectively.

It must be emphasized that the navy and air force had always had adequate, and at times a redundancy of volunteers. Only army enlistments lagged, mainly because of the apparently small chance of seeing action and the certainty of long monotonous training. Of the 975,000 men who had entered the services in the first five full years of the war, only 150,000 had been drafted. Of the draftees, 40,000 had



Prime Minister King addressing a political meeting at Montreal prior to his re-election in 1945

been discharged for ill-health or other legitimate causes and 48,000 had later signed up for service wherever they might be sent. The 60,000 draftees who refused willingly

to "go active" were performing important guard duties, working in supply depots and doing other essential tasks in Canada. The 875,000 who had enlisted for active service anywhere in the world were all volunteers, and the number was as large, relative to population, as the United States had raised by its draft. Nevertheless, the Canadian army in Europe, once it went into action on a large scale, was in danger of running short of replacements. Moreover, the number of draftees and volunteers from Quebec, relative to the population in the military age groups, was only about half the similar figures for other provinces. This could have been the result of bona fide rejections for medical reasons, in which case it was an appalling reflection on the living standards of one-third of the Canadian people. It might also have been the result of an attempt by French-Canadians to evade the draft for home defense by various subterfuges even though before the war they had assured the country that they would fight if Canada were attacked as it virtually had been when German submarines operated regularly in the Gulf of St. Lawrence. It might also be attributed to the fact that from the outbreak of war French Canada was suspicious that the English-speaking majority would not adhere to the tacit understanding not to order conscription for overseas—a suspicion which had proved well founded.

Election of 1945.—At any rate, only an election could clear the air of mutual recriminations. By the time this was held, in June 1945, the end of the war in Europe had weakened the main argument of the opposition that the government's manpower policy had been a miserable failure. All but violent partisans admitted that the King government had a good record on war production, price control and finance. Also it had made some plans for reconstruction, and the cabinet contained a small nucleus of more able and experienced men than the opposition parties were likely to have. As a result, the Liberals were returned with a small working majority. In a house of 245, they had 130 including independent (nonconscriptionist) Liberals from Quebec.

Even though Bracken's personality had failed to impress the country, his party was stronger numerically (60 members, chiefly from Ontario) and in debating ability. The C.C.F. under James Coldwell, a former school principal who was competent, aggressive but uninspiring, had 28 members, all but one of them coming from west of the Great Lakes. Social Credit carried most of the seats in Alberta. Only the Liberals could claim to have a reasonable representation from all sections of the dominion. The regional fragmentation of all the opposition parties caused some uneasiness among those concerned with national unity. It was significant, however, that the isolationist Bloc Populaire carried only two seats and that the Liberals, despite the conscription controversy, got 35% of the votes of servicemen outside Canada.

Throughout the entire period 1935-46, King had kept himself in power in Ottawa by an astuteness, born of years of experience, which angered his opponents, confused his own followers at times, but which nevertheless won elections and kept the country less disunited than would have been possible under any other leader. Never a man to arouse fervent enthusiasms, King had an uncanny sense of what Canadians were prepared to accept as the best practicable alternative to their widely divergent interests. In June 1946 he completed 20 years' service as prime minister, and his prestige in international and intra-commonwealth affairs was that of an elder statesman.

In short, the decade 1937-46 was politically important for the rise of the C.C.F., the apparent breakdown of the

old party alignment of Liberals and Conservatives, the persistent problem of dominion-provincial relations, the conscription issue and the long tenure of King. The postwar problems of full employment, social security, national unity, international peace and relative freedom of trade remained to tax the skill of Canadian political leaders.

(A. W. CE.)

External Relations and War Effort

The story of Canada's external relations during the ten eventful years 1937–46 had its beginning in a period of continuous international crises, a period that witnessed nation after nation advocate the progressive weakening of their commitments under the covenant of the League of Nations, a period that saw the failure of the powers, great and small, to permit collective security a fair trial despite the imminent danger of military aggression on a worldwide scale.

Canada's policy toward the League of Nations, largely in accord with that of most other confident "fireproof" powers during the middle 1930s, consistently expressed itself in opposition to the punitive portions of the covenant and thereby undermined the structure of collective security. Prime Minister King had summarized the league policy of the Canadian government when announcing the lifting of sanctions against Italy in 1936. While strictly enforcing such economic and financial sanctions as were invoked against Italy during the Italo-Ethiopian conflict, Canada did not believe in the application of force against an aggressor unless the principle of such application was universally accepted. "There is undoubtedly much that is attractive and persuasive in the conception of a world united to prevent by force a breach of the peace by any aggressor," declared King. "It has been stoutly contended that if all nations would undertake to make war upon an aggressor, and carried out that undertaking, war would never occur. That may well be, but unfortunately it is only a hypothetical argument; it bears no relation to the actualities of today." The required overwhelming preponderance of power, economic and military, as against any possible aggressor was lacking in the league, as was its universality anticipated by its founders who envisaged the league imposing peace throughout the world. While admitting that occasions might arise where military action might become advisable, the Canadian prime minister declared that "so far as Canada is concerned, that would be for parliament of Canada to decide in the light of all the circumstances at the time." If the league was in no position to become the international war office, it could at least perform the less spectacular role of developing and applying the instruments of conciliation and arbitration of specific disputes before they led to open challenges and entrenched positions. If there still remained any doubt of the Canadian government's policy respecting the use of league sanctions this was dispelled once and for all by King's statement in the house of commons on May 24, 1938, that "the sanctions articles have ceased to have effect by general practice and consent, and can not be revived by any state or group of states at will."

Policy of Caution.—The determining principles of Canada's external policy during the troubled years prior to the outbreak of World War II embraced the following: (1) maintenance of the unity of Canada as a nation; (2) priority of Canada's relations to the United Kingdom and the United States over its relations to the league of nations; (3) adoption by Canada of a back seat in all international discussions of European and Asiatic problems; (4) denial of any Canadian obligation to participate in

the military sanctions of the league and in the defense of any other part of the British commonwealth and empire; (5) denial of any obligation to participate in the economic sanctions of the league; (6) necessity of the Canadian government securing parliamentary approval in advance of any Canadian participation in military or economic sanctions or in war, and (7) willingness of Canada to assist in the restoration of international trade and to participate in international enquiries respecting economic grievances.

This inherently negative quality of Canada's external policy arose not only from the government's concern for the preservation of national unity. Its policy of nonintervention and "no-commitments" grew also out of Canada's feeling of detachment from Europe and Asia and a belief in its own "secure" position resulting from membership in the British commonwealth of nations and proximity to the United States. Canada's attitude, for example, in 1937 toward the Sino-Japanese conflict, was one of strict neutrality and of expressed readiness to support the United States and Britain (the obvious leaders of any efforts to restrain Japanese aggression) in movements "designed to restore peace in the Orient through methods of conciliation." This Canadian policy was in accord with that of the United States, which urged Japan and China to search for an amicable settlement. It was also one certain to win favour in Britain, which obviously was more vitally concerned with events in Europe at that time.

Additional examples of Canadian policy in accord with that of the senior member of the British commonwealth, during the last fateful years prior to the outbreak of World War II, occurred in connection with the imposition of a rigid Canadian embargo on aid to Spain in men and war materials during the Spanish Civil War (1937); the recognition of the king of Italy as emperor of Ethiopia (Dec. 22, 1938), in the hope of improving relations with Italy and thereby safeguarding the Mediterranean lifeline to Britain's eastern possessions; and the tacit and sometimes explicit support of the British government's policy of German appeasement during the Czechoslovakian crisis (1938-39). Like Britain and other western democracies, Canada was slow to realize that each surrender to the demands of the aggressive axis powers made a firm stand subsequently more difficult and ultimately ineffective. Even on the occasion of the Munich agreement (Sept. 29, 1938)—the high-water mark in Britain's appearement policy -the Canadián prime minister wired Arthur Neville Chamberlain: "The heart of Canada is rejoicing tonight at the success which has crowned your unremitting efforts for peace."

Canadian enthusiasm and heart-felt relief over the Munich settlement was of short duration once the shabby treatment suffered by Czechoslovakia became known, and when the nazis forcibly occupied Prague, parliamentarians and students of public affairs commenced a stock-taking of Canadian external policy that appeared long overdue. Discussions outside of parliament in 1939 displayed a chastening realism that Canada was still a small power with little or no choice but to follow the foreign policy of the United Kingdom. The "colonial mentality" of the most vocal elements of the English-speaking Canadians remained a dominant factor, although some began to advocate a clarification of Canada's right to neutrality in case the mother country became involved in a European war.

While presenting a carefully phrased exposition of Canadian government policy to the house of commons on March 30, 1939, King expressed himself in a manner that

indicated considerable sympathy with the nonintervention point of view. "The idea that every twenty years this country should automatically . . . take part in a war overseas for democracy or self-determination of other small nations, that a country which has all it can do to run itself should feel called upon to save, periodically, a continent that can not run itself and to these ends risk the lives of its people, risk bankruptcy and political disunion, seems to many a nightmare and sheer madness." Nevertheless, to those who advocated a resolution proclaiming the right of Canada to decide its own neutrality, the Canadian prime minister replied that the same consideration of the overwhelming importance of national unity which prompted his government to decline making premature statements of possible belligerency operated against declaring positive neutrality. Such a declaration might lead to passionate controversy within the country, especially between English-speaking and French-speaking Canadians, and would undoubtedly lend aid and comfort to a potential aggressor.

The Canadian government was determined to steer a middle course between those whose distrust of British policy and fear of imperialistic entanglements prompted them to advocate a declaration of neutrality and those whose traditional patriotic fervour led them to answer "Ready, aye, ready" in support of any action which it might be necessary for the British government to take. This middle course ruled out automatic commitments and conscription for overseas service while giving assurance of co-operation with the other members of the British commonwealth in any war of unprovoked aggression which gravely threatened the United Kingdom. Moreover, it was predicated on the assumption that Canada's major contribution in war would be industrial and that her military contribution would be relatively small and largely for home defense.

Thus it was that three years of debate on the grave issues of peace and war culminated in a heartening unity of spirit, a curious blend of resignation, tolerance, caution and idealism, as the Canadian people realized that all efforts for peace had failed.

Entry into War.—On the day (Sept. 1, 1939) that Germany invaded Poland the Canadian government issued a proclamation in the name of the king declaring that a state of "apprehended war exists and has existed since the twenty-fifth day of August," while the prime minister, in fulfilment of a long-standing promise, summoned parliament to meet on Sept. 7 for the purpose of authorizing "effective co-operation by Canada at the side of Britain" in case the latter became involved in a war with Germany.

When the Canadian parliament assembled and the speech from the throne was read, the intentions of the government regarding the nature of Canada's participation remained concealed, although Britain had formally entered war on Sept. 3. "You have been summoned," ran the speech, "in order that the government may seek authority for the measures necessary for the defense of Canada, and for co-operation in the determined effort which is being made to resist further aggression. . . . " King did not, however commit his government to a declaration of war until Sept. 9, when he announced that if the house approved the speech from the throne the cabinet would immediately take steps for "the issue of a formal proclamation declaring the existence of a state of war between Canada and the German reich." With the approval of the address that evening, a royal proclamation was issued on the morning of Sept. 10, wholly on the advice of the Canadian cabinet. Thus was settled a long-standing controversial question as to the ultimate scope of Canada's sovereign authority in international relations; thus did Canada enter the war at the side of Britain with the conviction that its interests were one not only with those of the mother country but those of world freedom.

At the outbreak of the war in Sept. 1939 Canada's armed forces totalled only 10,355 officers and men-a naval nucleus of 1,774, a permanent army of about 4,500 (exclusive of the nonpermanent active militia of approximately 60,000) and an air force of 4,060. With the progressive deterioration of the international situation, the estimates of the department of national defense rose from about \$23,000,-000 in 1936 to \$36,000,000 in 1937 and approximately the same amount in 1938. Nevertheless, in the summer of 1938, Canada still lacked anti-aircraft guns, tanks, armoured cars, heavy coastal ordnance and many other items of defense equipment. Of the peacetime defense appropriation of \$64,500,000 in the summer of 1939, the air force received nearly half, thereby indicating the service designated as Canada's first line of defense. Hence with a Royal Canadian air force of 11 permanent and 12 nonpermanent squadrons organized or in the process of organization, with additions made in fighters, bombers and advanced twin-engined trainers from England, advanced singleengined trainers from the United States and from Canadian plants, and with a nucleus of experienced fliers, Canada possessed in the summer of 1939 a force capable of patrolling its coasts and of rapid expansion for more distant theatres of war. The Canadian navy, the most neglected of the defense services, consisted at that time of only six modern destroyers, five mine sweepers and three small training vessels.

Despite various measures taken during the preceding three years, Canada was by no means adequately prepared for war. Nevertheless, if this inadequacy was the natural result of the Canadian government's strategy of caution, compromise, no conscription and no commitments pledges, its justification appeared in the calmness and unity of spirit with which the Canadian people freely entered the second World War within a quarter century. Following a series of prewar protective measures which provided for the transfer of air force squadrons to the Atlantic seaboard, the manning of coastal defenses and important installations, the inauguration of military mobilization, the proclamation of the War Measures act, the creation of the Wartime Prices and Trade board and the Foreign Exchange Control board, the September emergency session of the Canadian parliament passed a war appropriation of \$100,000,000, imposed a number of special taxes designed to finance the war on a pay-as-you-go basis, and authorized the creation of the department of munitions and supply (a War Supply board assigned contracts until the department was set up on April 10, 1940), to provide the necessary armaments and war materials and to co-ordinate the entire industrial production of Canada with that of the United Kingdom and ultimately with the whole Allied war effort.

Canada's immediate war program, the outcome of close consultation with the British government, embraced home defense, the protection of Newfoundland, Labrador, the British West Indies, and the French islands of St. Pierre and Miquelon, the rapid expansion of the Canadian navy, the creation of the largest possible air force through the development of a Commonwealth Air Training plan, the authorization of an army of two divisions—one to be recruited at once and made available for overseas service on a voluntary basis, if and when required, and the maximum

utilization of the nation's human and natural resources for the production of munitions of war, raw materials and food stuffs.

During the winter of 1939-40, however, the impact of various forces upon Canada's basic defense program brought about a significant shift in emphasis. The British manufacturers, captivated by the "Maginot line" concept of warfare and opposed to the rise of a competitive Canadian armament industry, postponed as long as possible release of the latest British designs, while the government of the United Kingdom, anxious to conserve Canadian credits for the purchase of food and raw materials, gave little heed at first to the urgent need of Canadian industry for British machine tools and blue prints so indispensable to a maximum Canadian war effort based upon the assumption of overseas service of men and material in conjunction with those of Britain. Moreover, the tendency of the Canadian public-spearheaded by newspapers and citizens of pronounced imperialist sentiment-to visualize the nation's maximum war effort in terms of hundreds of thousands of infantrymen, as was the case in 1914-18, rather than to appreciate the significance of a balanced and effective program and the costly and long drawn out demands of modern mechanized warfare, and finally the failure at this time of the government to instruct the public on the overall picture of the war effort it was contemplating, were other contributing factors in the shift in emphasisfrom a war effort predominantly industrial to one largely military. Only after the collapse of the Low Countries and of France did the tremendous expansion in Canadian manufacture of military equipment and munitions really get under way.

Whole War.—Hence, Canada committed itself to a big army policy early in the war. The crisis of 1940 prompted the Canadian government to announce on May 20 and 27 the addition of a third and a fourth army division, to be followed by notice of a fifth in Feb. 1941 and a sixth in August—thereby constituting an army establishment of five infantry divisions, an armoured division, an infantry tank brigade and headquarters and ancillary troops.

The Canadian army comprised not only general service personnel who enlisted voluntarily for service anywhere, but also men called up for compulsory service in Canada and its territorial waters under the National Resources Mobilization act of June 1940. Of the total male intake of 1,017,962 for the three armed services from Sept. 1, 1939, to Sept. 30, 1945, the army received 766,491, of which 608,435 were enlistments and appointments and 158,056 N.R.M.A. conscripts. About 59,000 of the latter availed themselves of the opportunity of volunteering, during the call-up process and training period, for duty overseas in any theatre of the war. Although thousands of N.R.M.A. men served overseas during the concluding months of the war under an order-in-council provision passed in anticipation of heavy replacement needs, over 86% of the Canadian army were volunteers, exclusive of 25,252 women serving in the nursing service and the Canadian women's army corps.

The Royal Canadian navy likewise underwent a remarkable expansion during the war. Within the six years its personnel grew, by voluntary enlistment alone, from 1,774 to 99,739, exclusive of over 6,600 in the women's Royal Canadian naval service. Of these 107,000 in uniform, 42.5% served at sea in the R.C.N.'s 939 naval vessels of which 378 were combat ships. While Canadian seamen in the early stages of the war received their basic training and special courses in the United Kingdom, subsequently

the greatly enlarged and improved naval bases at Halifax, Nova Scotia and Esquimalt, British Columbia, the R.C.N. college near the latter centre, the signals school at St. Hyacinthe, Quebec, and the 12 new bases developed on the eastern and western Canadian coasts and in Newfoundland and Bermuda provided the necessary training facilities. Aside from its remarkable shipbuilding program, which embraced 3,788,000 tons of cargo vessels, 486 naval escort ships and 3,542 other craft, Canada's five years' performance outlined below was such as to win it third place in naval power among the United Nations.

Overshadowing all other Canadian war activities were those which made Canada, in the words of President Roosevelt, "the aerodrome of democracy." Not only did the Royal Canadian air force recruit wholly by voluntary enlistment a total of 222,550 men and nearly 17,000 women during the war. It applied remarkably ingenuity, persistence and resourcefulness in its development and administration of the British Commonwealth Air Training plan, frequently regarded as Canada's major contribution to the victory of the United Nations.

University of the Air.—The British Commonwealth Air Training plan, based originally on a proposal made by the government of the United Kingdom to the governments of Canada, Australia and New Zealand on Sept. 26, 1939, and set forth in an agreement signed at Ottawa on Dec. 17, 1939, entrusted the Royal Canadian air force with the provision of all equipment (except advanced trainer planes) such as air fields, hangars and other buildings for 74 training schools, practically all the instructional staff, the administration of the scheme, and 80% of the trainees. Under the original agreement, Canada's share of the estimated total cost of \$600,000,000 was \$350,000,000, while the United Kingdom undertook to pay the air crew graduates serving overseas and to make other contributions in the form of aircraft, aircraft engines, and accessoriesa provision which almost wrecked the plan on the occasion of the German break-through to the North Sea in May and June 1940.

Thus the plan was in ruins almost before the project had begun to bear fruit, for the United Kingdom was now incapable of providing the advanced trainers and twinengine craft it had promised. In the midst of grave shortages in equipment, the Canadian government nevertheless decided to accelerate and expand every phase of the project under new schedules which were wholly Canadian. The nation pooled its construction industry to speed completion of the training schools, air fields and hangars and to provide the elementary training planes, while Washington came to the rescue with vitally important engines and advanced trainer planes. Additional assistance came through diverting shipments of planes for France and Sweden.

The measure of the success of this energetic program of establishing and developing a Canadian specialized university of the air was soon apparent. The last of the 74 training schools envisaged in the original plan, came into operation in Dec. 1941, six months ahead of schedule. By Jan. 1944, the time of maximum expansion, 154 air and ground training schools and 206 ancillary units were operating from 231 sites, with a faculty of 104,113 service and civilian personnel exclusive of 15,000 in training for staff positions. Down to March 31, 1945, the date of its termination, the B.C.A.T.P. trained and graduated 113,553 airmen, of whom 38% were pilots, 23% navigators, 12% air bombers, 25.5% wireless operators and air gunners,

and 1% to 5% flight engineers, at a cost to the Canadian government with respect to the training plan in Canada alone of more than \$1,281,000,000. The Royal Canadian air force provided 72,835 or 55% of the graduates under the plan, the R.A.F. 32% and the Royal Australian air force and Royal New Zealand air force the remainder. In addition, Canadians made up 97% of the 106,514 B.C.A.T.P. graduates of ground crew courses, and of these, over 35,000 proceeded overseas. Over 15,000 Canadians also served in the women's division of the R.C.A.F., thereby releasing thousands of men for combat duty.

The outstanding success of Canada's air program, not to mention at this point the mobilization of the nation's economic and industrial resources or the participation of the R.C.A.F. in air operations overseas, gave striking evidence of the fact that from the summer of 1940 Canada fashioned its all-out war effort in the interests not only of the utmost aid to Britain but of the defense of North America and ultimately of non-axis nations everywhere. As Britain's steadfastness continued to prevail against successive nazi onslaughts, the myth of North American isolationism dissolved, the peoples of Canada and the United States came to look upon the English channel as their first line of defense against the dictator states, and the U.S. government began to recognize the need for joint action with both Canada and Britain on behalf of their common security.

Joint Defense.—Canadian-U.S. wartime co-operation, while based upon urgent necessity of the two peoples for concerted plans on behalf of the defense of the northern portion of their hemisphere and for checking axis aggression, had its roots deep in a long history of increasingly friendly relations, based upon a common language, a common way of life, a continuous expansion of economic and cultural relations, and a growing awareness of the mutually advantageous and interdependent geographical positions of their respective countries. In addition, while remaining loyal to the British commonwealth tradition, Canada grew during the prewar years more North American in general outlook and in the orientation of its external policy, thereby constituting itself the major linchpin in Anglo-American relations.

Long-standing cordiality in Canadian-U.S. relations coupled with the realization of interdependent defense interests prompted Prime Minister King and President Roosevelt to discuss matters pertaining to North American defense as early as March and Sept. 1937. Joint staff conversations on Canadian-U.S. defense commenced the following year, and on Aug. 18, 1938, at Kingston, Ontario, President Roosevelt foretold the closer military co-operation of the war years when he gave assurance that "the people of the United States will not stand idly by if domination of Canadian soil is threatened by any other empire." The Canadian prime minister endorsed this significant expression of common defense interests when he replied two days later that: "We, too, have our obligations as a good friendly neighbour, and one of them is to see that, at our own instance, our country is made as immune from attack or possible invasion as we can reasonably be expected to make it, and that, should the occasion ever arise, enemy forces should not be able to pursue their way, either by land, sea or air to the United States across Canadian territory."

These mutual undertakings on behalf of continental defense, strengthened as they were by additional meetings of the heads of the two nations in Washington (Nov.

1938), in Canadian Atlantic waters (summer 1939) and in Warm Springs (April 1940), helped to bridge the gulf which the outbreak of war interposed between neutral and belligerent. The decision of the United States to withhold application of an embargo on the shipment of arms to Canada until the latter's declaration of war on Sept. 10, 1939, and the subsequent amendment of the Neutrality act (Nov. 4) in such manner as to permit Canadian import of U.S. arms and aircraft on a cash-andcarry basis and to exclude Canada and its territorial waters from the restrictive provisions generally applicable to combat and associated areas, gave evidence of official willingness of the United States to co-operate with the lone belligerent among the nations of the western hemisphere. During this period of crisis, when official opinion in the United States was far ahead of public opinion, the personal friendship and mutual confidence of King and Roosevelt, built up over many years, and the good sense of the Canadian people ensured against any belief arising that Canada was attempting to influence the policies or to interfere in the domestic affairs of its good neighbour.

Thus it was that when the prime minister and the president took the first formal step toward joint defensive arrangements between Canada and the United States at Ogdensburg on Aug. 17, 1940, the agreement won the acclaim of government and opposition parties and press alike in both countries. As announced on Aug. 18, the Ogdensburg agreement made provision for the establishment of a Permanent Joint Board on Defense to commence immediate studies relating to sea, land and air problems, including personnel and material, concerned in the broad sense with the defense of the northern half of the western hemisphere. Consequently, the two governments on Aug. 22 each appointed a civilian chairman, a diplomatic official as secretary and high ranking army, navy and air officers to their respective sections of the board.

Although security restrictions prevented publication of the board's recommendations during the war years, the fact that it held meetings in Ottawa, Washington, Boston and Halifax and subsequently in San Francisco, Seattle, Victoria and Vancouver during the autumn and winter of 1940, indicated its concern in an advisory capacity with the overall problems of Atlantic and Pacific coastal desense and the allocation of prime responsibilities to the respective governments. More specifically, the board recommended the reinforcement of naval bases at Halifax and Boston by a heavy concentration of air depots in Massachusetts and air stations in Nova Scotia and Newfoundland. The proximity of Greenland placed it within the initial view of the board which laid plans for its defense and that of the northeastern approaches to the North American continent. Moreover, in the Pacific area, the board recommended the construction of a chain of air bases from Edmonton to Alaska, with branch lines extending into the interior of British Columbia. It early became evident that the board's preliminary discussions and recommendations greatly facilitated the problem of proceeding with additional schemes of joint Canadian-U.S. co-operation after the United States entered the war. In fact the co-chairmen of the board (Mayor F. H. La Guardia and Colonel O. M. Biggar) announced on April 17, 1941, that "strategic plans for the military and naval defense of Canada and the United States have been completed and the board from now on will devote itself to keeping these plans up-to-date to meet changing conditions."

Almost simultaneously with the creation of the Per-

manent Joint Board on Defense, Britain and the United States negotiated a preliminary agreement (formally signed on March 27, 1941) whereby the former leased defense bases in Newfoundland and Bermuda to the latter and exchanged leases on several Caribbean bases for 50 U.S. destroyers. A protocol attached to this agreement safeguarded arrangements respecting the defense of Newfoundland already made by Canada and the United States in pursuance of recommendations of the joint defense board, and recognized that the defense of Newfoundland was an integral feature of the Canadian scheme of Atlantic defenses.

Prominent among other joint Canadian-U.S. defense projects were an agreement signed on March 19, 1941, providing for the development of navigation and power in the Great Lakes-St. Lawrence basin and a new interpretation the preceding November of the Rush-Bagot agreement of 1817 whereby ships of war might be built on the Great Lakes and offensive armaments installed, provided that the latter were not put into serviceable condition until the vessels had reached the sea. This latter symbol of friendly relations extending throughout a period of nearly 130 years received a further interpretation by an exchange of notes between the governments of Canada and the United States on Dec. 13, 1946, permitting the peacetime stationing of naval vessels on the Great Lakes for training purposes by either government subject to the proviso that full information concerning the number, disposition and armaments of the vessels was previously disclosed.

Perhaps the most striking examples of joint Canadian-U.S. responsibility for defense was a series of projects undertaken in northwest Canada and Alaska and carried to completion in record time through urgent military necessity and the prompt marshalling of the pioneering spirit, engineering skill and material and financial resources of the two co-operative peoples. The most significant of the series were the famous Northwest Staging route from Edmonton to Alaska that resulted from the development of the pre-Pearl Harbor Canadian airway facilities through longer landing strips, improved hangars and other aerial installations, the Alaska highway that followed the general route of the afore-mentioned airway, and the Norman Wells-Whitehorse Canol pipe line-all designed for the purposes of Alaskan and northwestern defense, offensive action against Japan and the dispatch of lend-lease aid to soviet Russia.

Under terms of the agreement signed by Canada and the United States on March 17 and 18, 1942, the United States undertook to build the Alaska highway, stretching from Dawson Creek to Fairbanks, and to assume the cost of construction and maintenance until the termination of the war and for six months thereafter unless Canada preferred to assume responsibility at an earlier date, while the Canadian government undertook to provide rights of way, timber and gravel, to waive import duties, sales taxes and licence fees, and to facilitate the free admission of labour and supplies from the United States. At the close of the war, in accordance with the agreements, the 1,250 miles of the road running through Canadian territory reverted to Canadian ownership and became an integral part of the Canadian highway system with safeguards against the composition of any discriminatory conditions respecting the use of the road as between Canadian and United States civilian traffic.

Likewise, the two governments co-operated in the construction during 1942-43 of the Canol project, involving drilling operations in the vicinity of Norman Wells, the building of pipe line from Norman Wells to Whitehorse

and from Skagway to Whitehorse, and the erection of an oil refinery at Whitehorse and storage facilities at Prince Rupert, the whole venture being designed to supplement tank car movements of oil over the Alaska highway and to provide oil for Alaska and the Yukon if axis action should interrupt tanker shipments up the coast.

Other less spectacular but nonetheless vital aspects of northwest defense included a closely integrated network of weather observation posts and forecast stations of special service to aircraft using the Northwest Staging and the Mackenzie river air routes, additional flying facilities in the form of flight strips, and telephone and telegraph lines built by the United States government along the general route of the Alaska highway. The genuine spirit of cooperation which prevailed between the governments, servicemen and citizens of the two countries in the Northwest during the war, remained to guide the postwar disposition of these same defense projects.

Canadian-U.S. wartime co-operation embraced also the productive facilities of the two nations. The chief measures for co-ordinated activity grew out of the Hyde Park declaration of President Roosevelt and Prime Minister King on April 21, 1941. This "economic corollary" of the Ogdensburg agreement had as its main objective the pooling of all available resources of the two countries in the interests of hemisphere defense and the rendering of aid to Britain and the other democracies. To achieve this end, Canada and the United States each agreed to specialize in those aspects of war production in which it excelled and to expedite the transfer of essential materials across the boundary. In addition, the United States undertook to ease Canada's exchange difficulties by increasing U.S. purchases of Canadian defense articles and by transferring to Canada British lend-lease materials for inclusion in Canadian manufactures for the mother country.

The attainment of the above goals was greatly facilitated by a series of joint committees, the first of which was the Materials Co-ordinating committee set up on May 1, 1941. As a further step toward the implementation of the Hyde Park declaration, the two governments in June 1941 appointed Joint Economic committees from among their official experts to effect a more efficient and co-ordinated utilization of the combined resources of Canada and the United States and to recommend ways of alleviating postwar economic dislocation. On the recommendation of the Joint Economic committees the two governments on Nov. 5, 1941, established the Joint War Production committee.

As a result of the substantial degree of integration already existing in war production between Canada and the United Kingdom and between Canada and the United States, Canada became on Nov. 10, 1942, a member of the Combined Production and Resources board formed five months earlier by the senior English-speaking powers. Thereafter, the three countries closely integrated and adjusted their production programs to the strategic requirements of the combined chiefs of staffs. Additional examples of integrated war effort included the work of the Joint Agricultural committee, established in March 1943, to review agricultural and food production in Canada and the United States, the Joint War Aid committee formed during the Quebec conference (Aug. 22, 1943) to study problems arising out of the operation of United States lend-lease and Canadian Mutual Aid programs, and the Combined Food board which admitted Canada to full membership on Oct. 29, 1943, for the purpose of obtaining an expeditious utilization of the food resources of the United

Nations. (See also Canadian-U.S. War Committees.)

Indeed, Canada constituted a vital link between Britain and the United States by virtue of the constant endeavour of the various joint committees, of which it was a member, to adjust at every stage of their defense and production programs the requirements of Canadian and U.S. aid to Britain with the demands of hemisphere defense and ultimately their own individual needs for the marshalling of a maximum national war effort.

The Military Effort.—Canada's contribution through its three combat services was in the long run hardly less significant than its efforts on the industrial front, despite the prewar belief of the government that its primary role would be the provision of munitions and foodstuffs. Before the winter of 1939-40 ended, the 1st Canadian division landed in England under the command of General Mc-Naughton, a former Canadian chief of staff and an artilleryman of high reputation. The 2nd division followed in the summer of 1940, and by 1943 the Canadian army overseas consisted of five divisions and a large variety of corps, army, G.H.Q. and communication troops. Organized into the 1st Canadian army with Gen. McNaughton as G.O.C.-in-C. in April 1942, the original Canadian corps then under Gen. H. D. G. Crerar was supplemented by the formation in Jan. 1943 of the 2nd Canadian corps with Gen. E. W. Sansom in command.

Although continuous Canadian army activity on the continent of Europe began on July 10, 1943, with the Allied invasion of Sicily, Canadian troops had served as garrison forces in the British West Indies, Newfoundland and Iceland, and as a highly mobile, defensive spearhead in the United Kingdom during the dark months of anxiety that followed the collapse of France and the evacuation of Dunkirk in the summer of 1940. In the interval, the Canadian forces surmounted the severe test of inaction with rare discipline and intensive training in assault technique which they applied with high courage in a "reconnaissance in force" against Dieppe on Aug. 19, 1942. When full-scale operations were launched against the Westwall in June 1944, it was apparent that the costly experience gained in the combined raid on Dieppe contributed to the success of General Dwight Eisenhower's momentous undertaking.

The 1st Canadian infantry division and army tank brigade went into action in Sicily in July 1943, as part of Gen. Sir Bernard Montgomery's 8th army. Crossing to the mainland on Sept. 3, it participated in the advance up the east coast of Italy and bore the brunt of heavy fighting around Ortona in December. Meanwhile an additional contingent of Canadians arrived, including the 5th Canadian armoured division and other units of the 1st Canadian corps under the command of Gen. Crerar. During the remainder of their Italian campaign, the Canadians played a major part in the costly penetration of the Gustav and Hitler lines in the Liri valley in May 1944, and the Gothic line in October. The following December found them participating in the drive on Ravenna and the Senio line, which fell in Jan. 1945.

Meanwhile, the approach of Operation "Overlord" (June 6, 1944) against Hitler's Westwall found the Canadian forces in Britain highly trained for their perilous task through many months of participation in combined operational and large-scale assault exercises. When D-day arrived, the 3rd Canadian division was one of the five Allied army divisions landing on the Normandy beaches. Other formations soon followed; by July 31 Gen. Crerar

was in command of the 1st Canadian army, concentrated in the extreme leftward sector of the Allied line around Caen, where its forces distinguished themselves.

Holding the left flank of the 21st army group commanded by Gen. Montgomery, the Canadian army broke out from the Caen bridgehead in August, drove south to capture Falaise and link up with the Americans, and assumed the arduous task of clearing the Channel ports and flying-bomb sites. Then followed the clearance of the Scheldt estuary, the opening of the Port of Antwerp to Allied shipping, the four bitter winter months in the Nijmegen salient in the Netherlands, and the participation in the crossings of the Rhine that commenced on March 23, 1945.

In April the 1st Canadian corps arrived from Italy to rejoin their comrades in the Netherlands as part of the 1st Canadian army. Following the consolidation of the Rhine bridgehead, this army, whose basic strength was five Canadian divisions and two armoured brigades in addition to troops of the British and army, the 1st Polish division and Belgian, Dutch and Czech brigades at various times, undertook the task of clearing the Netherlands. Despite the compliment of the German high command in consistently opposing the Canadian army with some of the best German troops, it shattered these in battle groups and up to May 4-the day prior to the mass surrender in the Netherlands and northwest Germany-took 192,000 prisoners. An additional 180,000 troops, mainly of the German 25th army, subsequently awaited disposal in those surrender areas.

The following weeks saw the Canadian army disarming these large forces, assembling them for removal from the Netherlands, co-ordinating underground forces eager to deal with the vanquished Germans, organizing relief and other essential welfare services of the civilian population, setting up effective military government in that portion of northwestern Germany then under Canadian command, and enabling the Dutch authorities to resume, by June 30, their governmental functions after the long German usurpation.

While the major contribution of the Canadian army took place in the Italian and northwest European campaigns, including that of the 1st Canadian parachute battalion, which dropped with the British 6th airborne division in Normandy early on D-day and again over the Rhine on March 23-24, 1945. Canadian units engaged in desperate fighting at Hong Kong in Dec. 1941, formed part of the United States-Canada special service force which was in action at Kiska, the Anzio beachhead and the drive on Rome, helped the United States forces in the Aleutians to reoccupy Kiska in Aug. 1943, and saw service from time to time in Newfoundland, Labrador, Iceland, Alaska, Gibraltar, Spitzbergen, the British West Indies and islands adjacent to the east coast of America. The total casualties suffered by the Canadian army in all these operations (as reported to Dec. 31, 1945) were 80,640, including 22,790 fatalities, 51,416 wounded, and 6,432 liberated or repatriated prisoners of war-losses much lighter than in the war of 1914–18, when nearly 60,000 of the 200,000 casualties were fatalities.

The Navy.—The service rendered by the Royal Canadian navy, which expanded more than 52-fold during the five and a half years of war, proved vital to the victory of the United Nations. Its main function prior to D-day was that of convoy protection and submarine hunting along the North Atlantic route, the lifeline of Europe. From the first weeks of Sept. 1939, to the victorious months of 1945 when the R.C.N. took over the entire close escort of

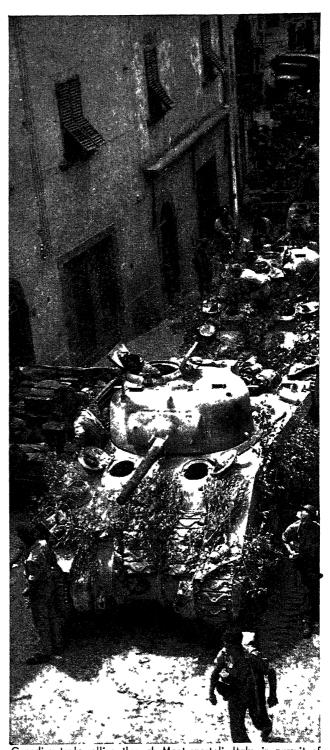
merchant convoys, its 378 combat ships convoyed 25,859 merchant vessels eastward from North American ports and 16,823 westward. They convoyed to the United Kingdom alone a deadweight tonnage of 235,104,856, the largest single merchant armada being one of 167 ships in Aug. 1944, bearing a cargo of more than 1,000,000 tons. As befitting this primary function, the R.C.N.'s numerical strength was in small vessels such as corvettes, frigates, mine sweepers, patrol vessels and auxiliary craft, constructed in Canadian shipyards.

Nevertheless, during the progress of the war, the R.C.N. greatly increased its offensive strength through the addition of 2 cruisers, 2 aircraft carriers, and a few dozen destroyers, including the Tribal, Fleet and escort classes built in British and Canadian shipyards, and 7 of the 50 U.S. overage destroyers delivered to Britain during 1940 in exchange for strategic land bases. Drawing upon its offensive power, the R.C.N. assisted in convoying the United Nations armada to axis-held bases in North Africa, provided four landing craft flotillas to help land the British 8th army (including the 1st Canadian division) in Sicily and Italy, aided the United States navy in its expedition to occupy Kiska in Aug. 1943, and provided Canadian sailors to man motor gunboat flotillas in the English channel. Moreover, there were at one time 2,000 Canadian seamen on loan to the royal navy, as well as a considerable number manning some of the heavier guns on merchant ships.

More than 100 R.C.N. ships and almost 10,000 seamen participated in the invasion of France on June 6, 1944. While 4 of Canada's Tribal class destroyers and a similar number of the royal navy engaged in assault work against German ships in the English channel and Bay of Biscay, and 2 new Fleet class destroyers bombarded coastal fortifications prior to the landings, other R.C.N. vessels, including 9 escort destroyers, 2 supporting groups of frigates, 19 corvettes, 2 flotillas of mine sweepers, 2 flotillas of motor torpedo boats, 14 assault craft, 2 huge infantry landing ships and 30 other landing craft, aided extensively in mine-sweeping the narrow channel, protecting the seaward flanks of the convoy routes, making the channel safe for reinforcements and supplies, and putting safely ashore many thousands of Allied troops. R.C.N. warships also took part in the invasion along the southern coast of France, and in the landing of British troops in Greece and the Aegean Islands during Oct. 1944. While Vice-Admiral Percy Nelles, chief of the naval staff of the R.C.N., acted as senior Canadian flag officer with general oversight of all Canadian naval forces overseas during the invasion of the continent, he did not have a definite command as Canadian ships participating in the invasion force operated in conjunction with other Allied forces, not as separate Canadian units.

As the final curtain fell on the Pacific war, Canada's plans called for participation in offensive action against Japan through the employment of approximately 13,500 men afloat and 60 ships, including 2 cruisers, an antiaircraft vessel, 2 new aircraft carriers, and a considerable force of destroyers and frigates.

Thus Canada's naval effort during the war was a not unimpressive achievement for a nonmaritime-thinking people who had placed complete reliance upon the British and United States navies for defense. To the winning of World War II—for the Allies, a war of supply by sea—Canada contributed not only 5,000,000 tons of shipping but also a moving steel wall of steadily increasing naval strength around the preciously ladened convoys, and considerable offensive power. The R.C.N. sank 17 U-boats,



Canadian tanks rolling through Montespertoli, Italy, in pursuit of retreating Germans. Montespertoli fell to Canadian armoured forces and British infantry in the Allied drive toward the German Gothic line in 1944

assisted in the sinking of another 10, and received credit for probably sinking or damaging several more. In addition, it sank, destroyed, captured or damaged at least 31 enemy surface craft and assisted other Allied forces in accounting likewise for another 80. Its losses, on the other hand, totalled 31 warships and 2,957 casualties including 1,985 fatalities, 264 missing, 87 prisoners of war and 621 wounded or injured.

R.C.A.F.-Finally, Canada made a tremendous contri-

bution to Allied air supremacy-in the opinion of Field Marshals Albert Kesselring, Karl Von Runstedt and Hermann Goering "the greatest single reason for the German defeat." To the attainment of that "unheard of superiority," the Royal Canadian air force made such heavy commitments in the development and administration of the British Commonwealth Air Training plan (described above) that its participation in air operations overseas was at first necessarily limited. Nevertheless, in Feb. 1940, an army co-operation squadron arrived in Britain to work with the 1st Canadian division, and in June another such squadron as well as a fighter squadron proceeded overseas. Gradually, new R.C.A.F. squadrons were formed in Britain from personnel trained under the B.C.A.T.P. until eventually 47 squadrons were operating with R.A.F. units in the four-commands-bomber, fighter, coastal and transport.

A separate Canadian bomber group, which commenced operations in Jan. 1, 1943, made as many as 25,353 sorties during 1944 and dropped over 86,000 tons of bombs in that year alone. In addition, there was a Canadian squadron in the Pathfinder Force of the bomber command which played a brilliant role in marking targets for successive waves of bombers.

In 1941 six additional units joined the original R.C.A.F. Fighter squadrons, and in 1944 the number was increased by six more. In 1942 an all-Canadian fighter wing was formed in Britain from three Spitfire squadrons, and later three more R.C.A.F. wings were set up. Down to the spring of 1944, the fighter squadrons were chiefly engaged in escorting day bombers of the R.A.F. and U.S.A.A.F. over airfields, rail centres and factories in axis-occupied territory. The fighters also engaged in low-level ground strafing against axis defenses, airfields, factories, power lines, locomotives and other vehicles. In addition, they did convoy patrol in British coastal waters and occasionally attacked axis ships attempting to slip from harbour to harbour.

In the spring of 1944, the R.C.A.F. fighter wings added a new role to their varied activities and became fighter-bombers. They played a significant part in dive-bombing rocket sites, bridges, freight yards and radar posts during the weeks preceding D-day, and from then onward were the spearhead of attack, covering the invasion beaches, dive-bombing German strongpoints, and taking a heavy toll of German transport and fighting vehicles.

A fighter-reconnaissance wing of the R.C.A.F. gathered tactical information in preparation for the opening of the second front, and continued this work deep into German-occupied territory during the invasion of western Europe. In addition, the R.C.A.F. contributed three night-fighter squadrons for the defense of Britain during the years 1941–44, and toward this end destroyed large numbers of flying bombs before they could reach their targets.

R.C.A.F. units operating from Britain, Canada and Newfoundland under the coastal command performed the vital but arduous duty of guarding shipping, sweeping over the seas in search of U-boats, shepherding convoys to port, or bombing axis merchant and naval vessels. Other R.C.A.F. units accompanied the 8th army in its triumphant advance from El Alamein to Cape Bon, across to Sicily and up the Italian peninsula, escorted convoys, carried freight and hunted submarines in the wide expanses of the Indian ocean, and finally provided several transport squadrons for the conveyance of troops and supplies to the Allied forces in the Netherlands and Germany.

While the strength of the R.C.A.F. increased during the

war from about 4,000 to over 206,000, with 47 squadrons serving overseas, approximately 20% of the air crew in the R.A.F. operational squadrons were also Canadian. Canadian pilots, navigators, wireless operators and air gunners served with the R.A.F. in every theatre of the war, including the skies over Malta, North Africa, Italy, Europe and Burma. Also, approximately 5,000 Canadian radar specialists were attached to the R.A.F. overseas.

Such was the record of the R.C.A.F. But the price Canada paid was heavy; over 16,800 R.C.A.F. airmen out of a total casualty list of nearly 22,000 gave their lives for their country and freedom's cause.

The contribution of Canada's land, sea and air services, which embodied more than 1,000,000 men, was such as to make Canadians intensely proud of their fighting men and of their country, despite the fact that the organization and direction of the three services overseas made them little more than subordinate branches of the British. Yet Canada's economic contribution to the Allied war effort was likewise magnificent: Its war production for 1939-45 totalled \$11,501,000,000 exclusive of \$972,000,000 for delivery of orders placed abroad. Its domestic exports jumped from \$924,900,000 in 1939 to \$3,218,300,000 in 1945. It provided mutual aid expenditures to the United Kingdom, Australia, China, France, India, New Zealand, the U.S.S.R. and the West Indies totalling over \$2,575,000,000 for war equipment, war materials and food. Its citizens and corporations purchased from Jan. 1940 to Oct. 1945, a total of \$12,673,400,000 in war and victory bonds, war saving certificates and war saving stamps. Its engineering achievements at Shipshaw, Steep Rock and Polymer-to mention only a few examples-resulted in the production of vast quantities of aluminum, high grade iron and steel and abundant synthetic rubber to meet the urgent demands of war. Clearly, the Canada of 1939 was, no more; in the course of the war years it emerged, in the words of its prime minister, "from nationhood into a position generally recognized as that of a world power," nearer in status to the great powers than to that of the small.

Canada as a "Middle Power."—In symbolic and practical recognition of Canada's new and peculiar status, its government adopted a policy in 1942 of reorganizing and enlarging Canadian diplomatic representation abroad. For example, Canada for the first time exchanged ministers with Brazil, Argentina, soviet Russia, Belgium and in Nov. 1943, raised its plenipotentiaries to the status of ambassador in the United States, soviet Russia, China, Brazil, Mexico, Chile, Argentina and Peru; at the close of the war, its ministers to France and Greece were made ambassadors. Moreover, the Canadian parliament during 1946 passed a bill providing for a distinctly Canadian citizenship and began debating the question of a distinctively Canadian flag.

Indeed, this achievement by Canada of national maturity and new "middle" power status became evident as early as 1944 in the debates of the house of commons concerning Canada's future role with respect to postwar collective security. Situated as Canada was in close proximity with the two greatest world powers, the United States and the U.S.S.R., and associated by tradition and sentiment with the third, the Canadian prime minister rejected a British proposal (as expressed by Lord Edward Halifax in Toronto on Jan. 24, 1944) for a unified and unanimous foreign policy "framed and executed by all the governments of the commonwealth," as a conception running counter not only to the future establishment of an effective system of world security but to the true interests of the commonwealth itself. In meeting world issues of



Principals of the second Quebec conference, Sept. 11–16, 1944. Front row, left to right: General George C. Marshall, Admiral William D. Lechy, President F. D. Roosevelt, Winston Churchill, Field Marshal Sir Alan Brooke, Field Marshal Sir John Dill. Back row: Major General Leslie C. Hollis, General Sir Hastings Ismay, Admiral Ernest J. King, Sir Charles Portal, General Henry H. Arnold and Admiral Sir Andrew B. Cunningham

security, Canada was opposed to the idea of power-blocs and the resultant inevitable rivalry between great powers. While its desire was to go forward in closest consultation with the other independent members of this unique community of British nations in the spirit of an "entente cordiale," relying on the common pool of ideals, traditions and usage in their attempt to reach joint agreement whenever desirable, the Canadian government took the view that its future commitments respecting the great issues of security should be part of a general scheme of international organization embracing not only commonwealth countries but all like-minded countries.

Thus the lessons of war, the fateful experiences of Britain at Dunkirk and after, the fundamental shift in power wrought by the presence of the United States and the soviet union in the inner councils of the United Nations during the Moscow-Teheran-Yalta-Potsdam sequence of conferences, the new "middle" status of Canada among the nations and its "central position in the power zone of the air age," not to mention the dependence of its highly precarious economy upon the establishment of world peace, "one and indivisible," and upon the free flow of international trade, all combined to swing the Canadian government and people around to a complete reversal of their pre-1939 League of Nations position. Indeed, the Canadian prime minister underlined in the house of commons on Aug. 11, 1944, this reversal of policy when he declared concerning the question of organizing world security: "We have made it clear that Canada will do its full part in carrying out agreed security schemes, whether they involve the creation of an international police force, or alternatively, the measures for seeing that there will always be a preponderance of power available to protect the peace."

It was a foregone conclusion, therefore, that the Canadian government and people would welcome the Dumbarton Oaks proposals as the bases for discussion in the fashioning of a strong postwar international organization. Yet this did not preclude criticism of the draft charter in parliament and subsequently at the San Francisco conference (April 25-June 26, 1945). From the outset Canada was conscious of the need of finding a compromise between the theoretical equality of the then 30-odd United Nations and the practical necessity of limiting national representation on international bodies in a practical manner. At San Francisco the Canadian delegation, representative of the three major political parties, pressed for such amendments as would give Canada as a "middle" power the influence in the organization that its contribution to the war effort entitled it. While recognizing the principle that power and responsibility should go hand in hand, they urged the conference not to act on the false assumption that power was exclusively concentrated in the hand of any four or five states.

In keeping with this attitude, the Canadian delegation achieved a considerable measure of success in its efforts to secure enhancement of the powers of the General assembly and Social and Economic council, the exemption of procedural matters from the veto of the permanent members in the Security council, and the recognition of the claims of middle powers that in the election of the six nonpermanent members of the Security council, due regard should be paid, "in the first instance, to the contribution of members of the United Nations to the maintenance of international peace and security and to the purposes of the Organization, and also to equitable geographical distribution." Backed by the Netherlands, Canada also secured an amendment, whereby an unrepresented member should be invited "to participate in the decisions of the Security Council concerning the employment of contingents of that member's armed forces." The validity of Canada's middle power concept of functionalism—the synthesis of power and responsibility at an intermediate level of international activity—was thus recognized without disturbing the effective operation of the Security council under great power control.

While Canada did not become one of the six nonpermanent members of the Security council, the General assembly of the United Nations, meeting in London from Jan. 10 to Feb. 14, 1946, recognized its growing influence in international affairs by electing the nation to two other highly important bodies-the 18-member Social and Economic council and the special Atomic Energy commission. It was the hope of the Canadian delegation that the Social and Economic council might foster those forces of economic, social and cultural co-operation so essential to the elimination of some of the most dangerous causes of war and thereby bring men and nations into new paths of constructive activity. Canada's membership on the Atomic Energy commission, resulting from its provision of the pitchblende deposits for the production of uranium and its share of much of the fateful secret with the United States and Britain, permitted it the opportunity to urge safeguards to ensure the use of atomic energy for peaceful purposes only and to protect mankind against the hazards of violation and evasion.

In many other respects Canada helped to point the way to the fundamental concept of the world as a single community. Especially did it apply its "functional" approach to the vital economic and social problems confronting the war-shattered world by giving unstintingly to the support of U.N.R.R.A., playing a prominent part in the establishment of the Food and Agricultural organization, the Permanent International Civil Aviation organization, the International Bank and Stabilization fund, and by working toward the elimination of all forms of prewar discriminatory treatment in international trade.

Thus did Canada, during the ten eventful years, cast aside its "no-commitments" policy of the interwar period, gird itself powerfully during five and a half years as a champion in its own right of the liberties of mankind, attain in the doing a new status as the principal "Middle Power" among the nations, and play no small part in the fashioning of international institutions in the interests of the security, liberty and welfare of all peoples.

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The Canadian Economy

To the economist, the ten years 1937–46 represented, for Canada, as for other countries, the slow development of long run forces with the more spectacular changes wrought by World War II superimposed upon them. A federation of 9 provinces with 12,000,000 people linguistically and cul-

turally divided between French and English, with strong political ties with Great Britain and equally strong economic links with the United States, with physical resources great in certain directions and cruelly limited in others, with a heavy stake in world trade, with a high standard of living which its citizens were jealous to protect—such a country had some basic problems peculiar to itself and other fundamental ones shared with other countries. Among these basic questions were full employment, social security, dominion-provincial relations, external trade and transportation. During the war some of these issues were allowed to solve themselves, and the economic aspects of the conflict—allocation of manpower, wage and price control, munitions production and so forth—occupied the centre of the stage.

The depression of the 1930s had hit Canada with exceptional severity. The deflation of prices was disastrous for a country whose economy was geared to the production and sale of such staples as wheat, lumber, newsprint, fish and base metals. As a debtor nation Canada was obliged to sell goods in competitive markets at depressed prices in order to meet heavy fixed payments for interest on money borrowed abroad. Moreover, the physical volume of external trade was cut by tariffs, quotas and barter arrangements as well as by the general decline in prosperity throughout the world. At home, a drought of unprecedented proportions hit the Canadian west. The production of wheat in Saskatchewan, which had averaged 265,-000,000 bu. annually for the years 1926-28, fell to an annual average of about 96,000,000 bu. for 1934-36. Total national income, which was \$5,272,000,000 in 1929, was reduced to \$2,812,000,000 in 1932 and on a per capita basis from \$526 to \$268. Though the general average was down about 47%, the decline in the two drought-stricken provinces of Saskatchewan and Alberta was 72% and 61% respectively. Of course reduced prices of goods and services enabled a dollar to "go farther" than four years earlier, but even so the shrinkage of real income after 1929 was serious, especially in areas exposed to decreases in the value and volume of exports.

Intractable Depression.—In dealing with the depression, Canada had been handicapped by a number of factors. It could do little to stem the world-wide trend toward nationalism in trade. Indeed, Canada raised its own tariff to the highest level in its history. Moreover, because the dominion had to import many essential goods such as cotton, citrus fruits, certain minerals and manufactures from abroad, the effect of any purely domestic policy, for example, a large scale attempt to "prime the pump" by government expenditures, would be soon drained off to other countries through larger purchases from abroad. The policy of easy money, adopted in Canada as elsewhere, had little buoyant influence because of the prevailing pessimism in business. Also, there was confusion within Canada regarding the proper course of action to take. The program of expediency which was often followed, inevitably resulted in working at cross purposes. Even if a consistent program had been devised, it would have been difficult to carry it into effect under the Canadian constitution and in the face of political ill-feeling between the dominion and some of the provinces. In short, the depression was extraordinarily severe in Canada and peculiarly intractable.

On account of the obvious importance of external trade to the economy, the government turned its attention to this problem early in the depression. In 1930 the tariff was increased considerably with the intent of preserving jobs for Canadians and insulating the country from deflation abroad. In 1932 under the Ottawa agreements, the various members of the commonwealth slightly reduced their customs duties *inter se* while retaining them against the rest of the world. Canada's external trade had improved slowly after 1933 until, in 1937, it approached a level which ordinarily would have provided full employment within the dominion. However, this increase was attributable chiefly to exports of gold stimulated by President Roosevelt's monetary revaluation and of base metals in response to the demands of war. Agriculture, fishing and lumbering were still plagued by poor markets abroad, and the large regions in Canada dependent on these industries were badly depressed.

The trade agreement originally made in 1935 with the United States was renewed with some modifications three years later. Though it was far from the full reciprocity for which successive Canadian governments had struggled for decades and then finally rejected in 1911, it did permit more favourable access, especially for lumber and dairy products, into the most convenient and prosperous market for Canada. In 1938, also, Canada and Britain arrived at an agreement reducing or giving guarantees against increases on a wide range of commodities. The Canadian concessions to Britain were greater than those received from Britain, presumably because since 1932 British exports to Canada had increased less rapidly than those in the reverse direction. A party nominally favouring low tariffs was in power in Ottawa, but there were no serious breaches in Canada's protective system. Tariff-making had become a highly technical task because of the need for balancing the conflicting claims of various interested parties and for preventing the extension, by means of the most favoured nation clause, of benefits to countries which had not given an adequate quid pro quo.

Besides tariff policy, the governments of Canada and the United States renewed discussion of the proposal for building the St. Lawrence waterway so that vessels with draughts up to 27 ft. could travel between tide water and the head of the lakes, and for developing the hydroelectric power along the route. The Canadian parliament passed the necessary legislation, but the U.S. senate rejected the treaty notwithstanding the enthusiastic support of President Roosevelt. The province of Ontario objected to the scheme because it would add to the public debt, injure the railways and generate power for which no market could be foreseen.

In 1935 a Liberal government in Ontario had repudiated contracts made by the previous Conservative administration for the purchase of power in wholesale quantities for the publicly owned system in Ontario from privately owned companies in Quebec. Various legal technicalities and the argument that the contracts put the public system of Ontario in bondage to the power barons of another province were used as excuses to get rid of obligations to buy, or at least to pay for, power for which there was no market during the depression. Later, after some political manoeuvring, these contracts were renewed on terms more favourable to Ontario. The dominion refused to permit the export to the United States of the surplus power still existing.

Throughout the depression the problem of deficits on the publicly owned Canadian National railways occupied a large measure of government attention. The railway, formed in 1923, comprised various companies which had failed to pay their way financially and which would have gone into bankruptcy during World War I if it had not been for government assistance. It included also other lines which had been constructed originally by the public.

Some of the railroads were poorly built and had high operating expenses. Because many of them were designed to compete with each other, proper co-ordination was lacking. All of the constituent companies were overcapitalized so that, when depression and drought hit the country, the system could not pay its bond interest and the government had to meet the huge deficits. In 1932 alone, the dominion contributed for this purpose virtually all the receipts from the income tax.

A royal commission, appointed in 1932 to investigate the problem, castigated the Canadian National railways for extravagance in building hotels, constructing unnecessary branch lines, introducing luxurious passenger services by rail and coastal steamers, and generally competing in a wasteful manner with the Canadian Pacific, the large and world-famous privately owned system. At the same time it did not relieve the latter from its share in the general competitive folly. The commission recommended an aggressive attempt to cut expenses by eliminating duplicating services and unprofitable branches. In carrying out this plan, the managements of the railways tried to balance gains by one road against gains by the other. Neither system was prepared to give up any competitive advantage, and thus the savings were negligible in relation to the continuing inability of the Canadian National to earn its bond interest and of the Canadian Pacific to pay dividends on common and preferred stock.

In 1937 Sir Edward Beatty, president of the Canadian Pacific, began a campaign for unification. The physical properties of each line were to be owned by their existing proprietors but they were to be operated as a single unit by a board of directors nominated jointly by the two roads. The savings which, Beatty claimed, would amount to \$75,000,000 a year with the traffic volume of 1930, would be divided in an agreed ratio. Canadian National officials believed that the savings were greatly overestimated even if one imagined that the public and organized labour would be so docile as to allow a railway management ruthlessly to apply drastic measures. Some shippers questioned whether a single road would give the same quality of service as the two competing ones, though Beatty insisted that these fears were groundless because of the competition with carriers by water and highway and the spirit of service pervading railway management. Financial interests in Montreal and Toronto favoured unification. After some jockeying for position, all political parties officially opposed the scheme. The tremendous increase in the volume of railway traffic during World War II permitted both systems to make large profits, and the "railway problem" temporarily solved itself.

Meanwhile, the government through the Canadian National railways had set up Trans-Canada Air Lines which, by 1946, was providing high quality service from Victoria, B.C. to St. John's, Newfoundland. It was also operating on the transatlantic route and planned still other extensions. The so-called bush operators flying the short north-south routes from railhead to isolated mining camps had been consolidated into one system by a subsidiary of the Canadian Pacific which was not, however, allowed to operate transcontinental or transoceanic services. An Air Transport board was set up in 1944 to plan a postwar pattern for civil aviation in Canada. Air transportation had become of vital importance to Canada because of its value in carrying passengers and freight to isolated districts and because of the dominion's strategic position along the Great Circle route between the large

cities of the United States and of Europe and Asia.

Province-Dominion Dilemma.—Dominion-provincial relations were a thorny topic in the pre-World War II period. The framers of the British North America act, 1867, Canada's constitution, clearly intended that the federal government should have the preponderance of taxing and legislative power. They gave it jurisdiction over national defense, money and banking, the post office, most railways, navigation, criminal law and so on, and the right to raise money by any method of taxation. The provinces received control of such matters as education, municipal institutions, local public works, property and civil rights within the province and the levying of direct taxes. Because the dominion had the bulk of the taxing authority it was to pay annual subsidies to the provinces on the basis of population.

The precise meaning of the terms of the B.N.A. act was determined by the Judicial committee of the privy council, the highest court of appeal for Canadians, sitting in England. Over the course of the years this committee strengthened the powers of the provinces as opposed to those of the dominion. Furthermore the natural course of events tended in the same direction. Minimum wages, factory laws, social security measures, education and the like came under provincial jurisdiction. With the steadily growing industrialization of Canada, the practical field of provincial law-making power expanded, altogether apart from the legal decisions. This growth of authority was not accompanied by any change in the legal right to tax 'nor by any proportionate augmentation of resources subject to provincial taxation. Provincial debts and financial needs were growing much faster than tax revenue, particularly in those provinces which suffered severely in the depression. The situation was not so acute in Ontario and Quebec, where it was possible to tax the concentration of corporate and individual income and property in Toronto and Montreal even though part of this wealth had been derived from business profits originating in other provinces.

The discrepancy between jurisdiction and revenue had grown wider through the years, but the problem had been deferred by extra subsidies which under various subterfuges had been paid to the outlying provinces, and by conditional grants, i.e., direct payments by the dominion to the provinces provided the latter would administer and make small contributions to such matters as old age pensions. By the 1930s, the arrangements for the payment of subsidies had become wholly illogical. Conditional grants were objectionable because they forced a province to come into some scheme when it might otherwise have preferred to stay out. If it refused to enter, its citizens would, through the taxes they paid to the federal treasury, be paying for benefits received by other provinces while they obtained none themselves. A final difficulty was that in the depression the revenues of some provinces had declined so greatly that they were unable to meet their expenses for interest, education, relief and so on. Accordingly the dominion had loaned large sums to certain provinces with little hope of repayment.

Matters were brought to a head by the decision of the Judicial committee on the "New Deal" legislation of Prime Minister Richard Bennett. The federal government had hoped that the committee would follow its opinions in the Radio and Aeronautics cases (1932) which, by placing these subjects exclusively under the dominion, seemed to reverse the previous trend toward upholding provincial

rights. Instead, the committee, sustaining the supreme court of Canada, denied the dominion control over unemployment insurance, the marketing of primary products, minimum wages and limitation of hours of work. All these items were considered to deal in pith and substance with property and civil rights; therefore the dominion could not interefere with them under the guise of its authority to carry out certain treaties or conventions with other nations. For all practical purposes the decision made it impossible for Canada to have a nation-wide system of social legislation or to deal as it wished with the problems of the depression unless, of course, it had the B.N.A. act amended, a difficult task in view of provincial jealousies.

In order to re-examine the economic and financial basis of confederation and the distribution of legislative power in the light of the economic and social developments since 1867, the federal government in 1937 appointed a five-man royal commission under the chairmanship of Chief Justice N. W. Rowell of Ontario and, after his illness, of Professor Joseph Sirois of Quebec. Most of the provincial governments and many organizations submitted their views, and finally the commission made recommendations with respect to responsibility for the unemployed, provincial debts, the levying of income taxes and the anomalous subsidy arrangements. Early in 1941, a conference of federal and provincial cabinet ministers called to deal with the proposals came to an abrupt and unedifying close. Ontario and British Columbia objected to the recommendations in their entirety because, they claimed, they were being asked to give up much more than they received. The Ontario government also took umbrage at the fact that after the resignation of Rowell it had no member on the commission. Alberta refused to consider the plans further because of ill-feeling with the dominion over the legality of Social Credit legislation. New Brunswick and Quebec, though not approving the entire scheme, were prepared to use it as a basis for discussion while the other four provinces would accept it with minor modifications.

Social Credit.-Meantime, the government of Alberta under Premier William Aberhart had been trying since its election in 1935 to introduce social credit. The theory of this particular brand of monetary reform was confused by logical inconsistencies, mystical language and, in Alberta, by the religious fundamentalism of Aberhart's Prophetic Bible institute. At all events social credit considered that the cause of business depressions is a deficiency of purchasing power. To provide the money necessary to take off the market all the goods produced, the assets of the province were to be appraised and used as security for "scrip" which would bear a tax of two per cent a week to keep it circulating rapidly in the purchase of goods. In its cruder form a social credit dividend of \$25 a month was promised. Thus, "fountain pen money" would prevent business slumps while preserving individual enterprise and private property. Neither the public debt nor prices were to be allowed to rise. Basically, Aberhartism was a product of the depression in a drought-stricken area where interest charges were maintained and farm prices had collapsed.

Whatever may have been the merits of social credit, its introduction into a single province of Canada ran counter to federal government's exclusive jurisdiction over currency, banking and interest under the B.N.A. act. The courts quickly held Aberhart's initial legislation invalid. In 1937 Alberta passed legislation nullifying the adverse ruling, but the federal government set this aside by using its rusty but legal privilege of disallowing provincial laws. Subsequent Alberta legislation limiting the rights of the press failed to become law because the lieutenant governor,

acting under almost obsolete authority, reserved royal assent. The controversy over jurisdiction resulted in lengthy, heated arguments between the Alberta and federal governments and between the so-called monetary heretics of the west and the conservative bankers of the east. As a concession to monetary reformers the dominion government nationalized the central bank; the Bank of Canada, by buying out that half of its share capital which was privately owned. In practice this did not involve any radical change in banking policy. In the meantime the Social Credit party was torn between the radicals who would tolerate no delay in the introduction of their favourite panacea, and the conservative wing led by Aberhart, who was prepared to give business-like administration in most directions while pressing for social credit as an ultimate objective.

Despite the quarrelling over monetary and constitutional reform, Canadian business was improving. In 1937 national income reached a total figure of \$4,368,000,000 and a per capita of \$395. Unfortunately this improvement was short lived, a decline of roughly 5% occurring in the following year. This was due to the recession in the United States, another poor grain crop in the west, and the steadily deteriorating international situation. More Canadians were employed in 1938 than in the previous year but population had grown, and so the numbers on relief kept fairly constant. The construction trades lagged, though a government scheme for giving financial aid to home builders among the middle income groups had some success. A concurrent plan for helping low cost housing broke down because the municipalities, hard pressed by heavy expenses and loss of tax revenue during the depression, refused to grant the necessary tax exemptions. Wholesale prices improved, and visible stocks of grain were down to normal levels for the first time in ten years. Business confidence was shaken by labour unrest. Strikes which occurred in automobile and electrical plants in Ontario were over wages and union recognition. Basically they were offshoots of the U.S. labour movement revitalized by the Congress of Industrial Organizations. The textile strike in Quebec was conducted by the indigenous Catholic unions and was primarily a protest against low wages and the allegedly arbitrary actions of the management of an industry favoured by a high protective tariff.

Varied Effects of War.-From the declaration of war to the fall of France and the Low Countries there was no substantial change in economic conditions in the dominion. Taxes on luxuries and on incomes were increased and an excess profits tax to prevent profiteering was instituted. A Wartime Prices and Trade board was created to prevent undue enhancement of prices. The Canadian dollar, in sympathy with the pound sterling, depreciated about 9% in terms of the U.S. dollar, thus increasing the difficulty of meeting interest payments on debts owed in the United States by Canadian governments, corporations and individuals. A Foreign Exchange Control board was established to prevent the flight from Canada of capital needed in the anticipated wartime expansion. A few large armament orders were received from Britain, but manufacturers there were reluctant to share their plans and production techniques with potential competitors. Canadian business men who expected that the war would lead to an immediate boom complained. The 1939 wheat crop was the largest in history and the price was improved. Nevertheless, business as a whole was sluggish. Canada's role in the war was expected to be fundamentally that of a producer of munitions, the defender of its own territory, of Newfoundland and the British West Indies, and the supplier of limited numbers of men. In the first eight months of the war Canada, no less than its allies, was deluded by the Maginot line psychology.

The unexpected victory of German aggression on the continent of Europe left Britain and the commonwealth for over a year, as the sole belligerents defending the democratic way of life. Canada became one of the arsenals of democracy and at once placed itself on an all-out war footing. Economically speaking, the basic problem in wartime is simple—how can the productive resources of 'a country be enlarged and redirected toward the all-important objective of winning the war? This fundamental problem can be broken down into questions of manpower, wages, price control, agriculture, munitions output, foreign exchange and finance.

Manpower.—At the outbreak of hostilities there were on relief approximately 400,000 wage earners or about 11% of the then working force. This reservoir of idle labour constituted the first and obvious source of manpower to meet the needs of the armed forces and the munitions industries. As a matter of fact, the figures for idle workers were grossly understated. During the depression many persons did not trouble to record themselves with official agencies as seeking work because they knew no jobs would be available for them. Still others had part-time employment on farms or in lumber woods or in odd jobs, worked full-time on their own account or for others at substandard wages, or were supported by relatives. These statistically hidden unemployed were drawn on as the war progressed. In addition, young persons were induced by high wages or patriotism to leave school at earlier ages than would otherwise have been the case and older men who would normally have retired remained on the job longer. Married women secured work in war plants. Altogether the numbers of gainfully occupied, including the armed services, grew from an estimated 3,863,000 in Oct. 1939, to 4,578,000 in Oct. 1941, and then to a peak of about 5,100,000 from the spring of 1943 to the end of the war in Europe. Expressed in different terms and allowing for natural increase, in Oct. 1939, 46% of the total population 14 years and over were in the armed forces or gainfully occupied compared with 56.5% in April 1945.

The shifts in employment regionally and industrially were important also. Saskatchewan actually lost people and the other prairie provinces failed to hold their natural increase. Quebec, Ontario and to a less extent British Columbia gained, while the maritime provinces had full employment for the first time since 1919. New communities sprang up around military camps and explosives plants. Rapid expansion occurred in large cities like Montreal and Toronto and in many smaller centres such as Kingston and Chicoutimi. Between 1939 and 1945 the number of gainfully occupied increased nearly three times in fishing and forestry, nearly doubled in manufacturing, and showed some increase in transportation, communication, trade, finance and consumer services. Declines were experienced in agriculture and also in mining, where restrictions on gold production were not offset by increases in the extraction of base metals used for war purposes. Employment in construction, after increasing during the building of military establishments, emergency housing and munitions plants, was cut to half the 1939 figure by the end of the war. In order to obtain workers with the necessary skills, vocational training was energetically promoted both in civilian industry and in the mechanized fighting forces.

By and large, the regional and occupational shifts were made voluntarily in response to higher wages, steadier work or patriotism rather than under official compulsion. To be sure, in mid-1940 a registration of all persons over 16 had provided the government with a detailed knowledge of the skills of the people and the National Resources Mobilization act had given it almost complete authority over the allocation of manpower. This extraordinary power was used sparingly and then mainly to call up men for military service within Canada and to freeze to their jobs essential but relatively poorly paid workers like school teachers and farm help. This reluctance to use compulsion was primarily because of the opposition of French-Canadians, as explained above.

By July 1942 the shortage of manpower was beginning to make itself felt. The director of selective service who was responsible for administering the manpower regulations became impatient with the tardiness of the government in dealing with this problem. He advocated a more complete system of compulsory assignment of workers to essential war jobs than the vague one then in force, the closing down of certain industries and drastic action to reduce absenteeism. The government refused to accept the principle of a labour "czar," certainly not one outside the cabinet. For a time the controversy died down, but by late 1944 the acute shortage of men in the Canadian army overseas raised the manpower problem again in what was for Canada a political atomic bomb, the conscription issue.

Wartime Wages.—As labour became scarce, wages tended to rise. Unchecked, spirally increasing wages would have greatly raised the monetary cost of the war and enormously complicated the problem of manpower allocation. Moreover, in plants working on government contracts, the employer was often inclined to side with the men in their demands for higher wages because higher costs could be easily passed on to the public. To forestall these developments, the government put the details of wage determination in war plants and shipyards, later extended to all industry and trade, under a National War Labour board and forbade strikes until after a conciliation board had investigated and made a report. Finally, in Oct. 1941, it tied wages in all lines of employment to the cost of living. As the index of the cost of living rose above the 1939 level, workers would be automatically entitled to higher wages in accordance with a sliding scale which slightly favoured the low income groups. Firms which had not, during the war, increased their wages beyond the 1939 level were authorized to do so, but any further increases could be made only as the cost of living index rose or with the permission of the War Labour board, which was to iron out regional and occupational discrepancies. Because the government did all in its power, including the payment of subsidies on commodities, to hold down the index, wages rose only modestly after 1941. The board found it increasingly difficult to carry out its functions in the face of pressure by labour unions for upward adjustments, each minor individually, but serious cumulatively.

During the war, organized labour strengthened its position. Membership grew from about 360,000 in 1939 to 700,000 in 1945 and spread out from the prewar fields of transportation, coal mining and clothing manufacture to the automotive, aircraft and general industrial fields. Running parallel with U.S. developments, the industrial as distinct from the craft unions made the greatest relative gain while the Catholic unions remained stationary in numbers.

In 1940 the government granted labour in war plants the full right to organize and bargain collectively with employers. Though apparently receiving privileges identical with those under the Wagner act, organized labour protested that company unions were flourishing, that the government was consistently refusing to make labour a full partner in the war effort, and that labour's rights were being whittled away without consulting it by such ordinances as those freezing workers to their jobs and tying wages to the cost of living index thus keeping substandard wages depressed. Meanwhile all the provinces except Quebec and Prince Edward Island had enacted laws patterned after the Wagner act, but temporarily this legislation operated subject to the federal wartime regulations.

For the duration of the war, unions pledged themselves to avoid strikes and to increase production. Nevertheless, strikes with which the official conciliation machinery seemed, for a time, helpless to deal, occurred in steel, aluminum and coal. Even so, the number of days lost by strikes was smaller, relative to the total number of mandays per annum, than in the United States. In order to increase output unions worked successfully with management on joint committees to improve efficiency and reduce accidents. Suggestions from employees were also valuable in helping the war effort on the munitions front.

Finally, during the war, organized labour departed from its policy, traditional in the United States and Canada but not in Britain or Australia, of eschewing ordinary party politics. Some unions officially endorsed the Co-operative Commonwealth Federation, the Canadian Socialist group. On the other hand, many unions and individual members were reluctant to go far along the road toward supporting an independent labour or farmer-labour party. In sum, notwithstanding the fact that during the war the normal functions of unions in determining wages and working conditions were abrogated, the unions were much stronger at the end than at the beginning of hostilities. Yet even in 1945, union membership was only about 20% of the total wage-earning group.

Battle Against Price Rises .- Wartime control of the prices of commodities and services was necessary to keep down the financial cost of the war and prevent the injustice and social unrest which would arise if goods were available to the wealthy and not to others. For the first two years after its establishment in 1939, the Wartime Prices and Trade board, the price control agency, was concerned chiefly with the allocation of scarce, commodities like wool, sugar, fats and leather which were of direct importance for the war. Canadian industry, producing far below capacity in the prewar period, was able to fulfil the needs of the civilian population as well as the requirements of the war itself. It was not until early in 1941 that buying power (boosted by 1,000,000 new jobs) overbalanced supplies (depleted by war needs), and higher prices began to appear to any serious extent. The cost of living rose in the seven months after April 1941, as much as it had risen in the preceding 20 months. To prevent still further sky-rocketing, the government ordered that after Nov. 2, goods and services, with a few exceptions, might not be sold at prices higher than those in effect in the base period of Sept. 15 to Oct. 11, 1941. To reduce pressure on the ceilings, the Prices board kept costs down by means of orders simplifying packages, restricting the number of styles available, tightening up on the extension of credit to consumers, and eliminating nonessential deliveries. Wages, of course, were also government controlled.

Many farm products such as fruits and vegetables were at first exempt from the ceiling, and in the case of meat several increases were granted before, finally, almost all agricultural goods were brought under strict price control. Many farmers, remembering the burden of debt they had to carry during the depression and fearing a repetition of the collapse of prices after World War I, agitated for increases in the goods they sold. Most of the rural population, however, accepted the scheme because they realized the absolute necessity of it in the overall war effort, because they gained when they bought goods for their own use, and because they received direct cash subsidies on milk, cheese, butter and feed.

The prices of goods imported from countries where the price level had risen after the Canadian ceiling was applied had also to be subsidized. Further, to reduce the pressure on prices caused by available spending power from wages and other sources being far in excess of the volume of consumers' goods on the market, purchasing power was siphoned off through higher taxes and war loans. The net result of all these efforts was that the cost of living index (1935–39=100) which stood at 115.8 when prices were frozen, had risen to only 119.0 in May, 1945.

Accompanying price control proper there had to be an equitable distribution of scarce goods among various regions, retailers and ultimate consumers. The board worked out and applied a quota system based on what different districts and distributors obtained in 1941 with allowances for population shifts occurring after that year. For consumers tea, coffee, sugar, preserves, butter, meat and gasoline were rationed on the basis of specific quantities available weekly or monthly for each person or automobile. The sale of household electrical appliances and some other goods was prohibited. For producers, an elaborate system of priorities for scarce goods, notably steel, copper, timber and machine tools was developed by the War Industries Control board and tied into a corresponding U.S. plan. None of these control measures worked without friction, and at times the whole structure seemed to be endangered by pressure from farmers or labour unions as well as tardiness with which price control was instigated and, later, by the speed with which it was withdrawn, in the United States, with whose economy Canadian prices were closely knit. Nevertheless, because of the willingness of the public as a whole to co-operate, the determination of the government, and the skill of the administrators, price control was a conspicuous success in Canada's war effort.

Agricultural Shifts.—On agriculture the war had far reaching effects. Some prewar markets were lost-Germany, Belgium, France and the British outlet for fresh beef, dressed poultry and apples. On the other hand, the British demand for bacon, eggs, honey, condensed milk, cheese and other articles of high food value per unit of volume expanded greatly. Domestic consumption, particularly of milk, eggs and meat, grew rapidly with higher family incomes. Thus there were shifts in the location and the character of the markets. Moreover, ceiling prices were set. Committees of the federal and provincial departments of agriculture planned production in advance in accordance with the dominion's own needs and its commitments to Britain. Special boards were created to manage carefully the movement of bacon, wheat, dairy products and so forth to overseas markets in accordance with shipping and storage space. New techniques were devised for curing bacon while on its way to market, for installing refrigerating equipment in ships and for dehydrating fruits and vegetables.

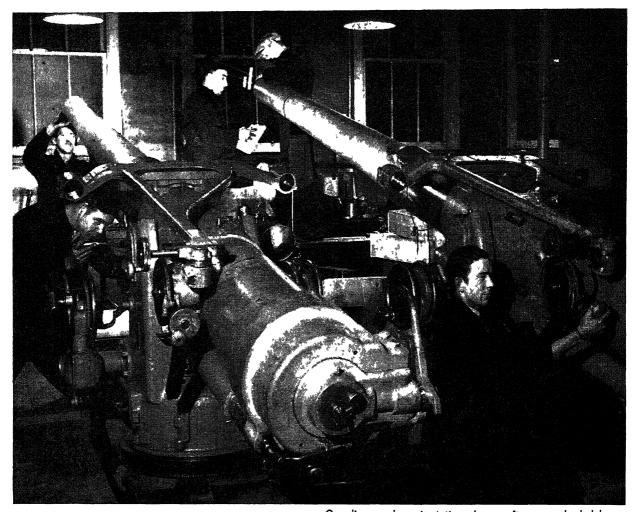
In order to satisfy the enlarged market, eastern Canada intensified its prewar attention to dairy products and live-stock, and the prairies shifted away from wheat, the shaky

reed on which it had leaned so heavily before 1940. The bumper grain crops of 1939 and 1940 overtaxed existing storage capacity, especially in view of the frequent shortage of shipping space across the Atlantic. Farmers were paid for storing grain on their farms, elevators were allowed to accept grain from farmers only in accordance with quotas laid down by Ottawa, and the government paid part of the cost of transporting grain to eastern Canada for feeding livestock. Finally, prairie farmers were subsidized to take land out of wheat and devote it to pasture, coarse grains or summer fallow.

In terms of physical goods production more than doubled. This was attained without any appreciable increase in acreage or in the amount of machinery used. In fact, the number of men engaged in agriculture was decreased by heavy enlistments from rural areas in the first years of the war, by a continuance of the normal trend toward cities, and by the existence of good-paying, steady jobs in munitions plants, where the demand for labour had risen earlier than in agriculture. By 1942 farming had begun to feel the pinch of a labour shortage which continued into the postwar period. To increase production, those remaining on farms had to work harder and longer; the enlistment of bona fide farmers was discouraged; farm machinery was used more intensively or shared among neighbours; farmers' wives, students, urban residents, prisoners of war, and Japanese removed from Pacific coast areas for strategic reasons, helped out in the emergency. The amazing growth in farm output was no less important in the war effort than the production of direct weapons of war.

Munitions.—Canada's munitions program was slow in getting under way mainly because of the general psychological background of the "phony" war period. In mid-1940 the shooting war and the fall of France tremendously speeded up plans. A department of munitions and supply was set up under C. D. Howe, an engineer of great acumen. Gathering about him men of proved ability, Howe placed huge orders with existing industries and shipyards, erected new plants, and conquered one bottle-neck after another. Aircraft, ships, guns of all types, armoured fighting vehicles, trucks, chemicals, explosives and machine tools poured out in a steady stream. A synthetic rubber plant was established in record time to supply most of Canada's wartime and peacetime needs. With almost no previous experience, optical glass and instruments, radar and machine tools were produced in large quantities. A hydroelectric plant as large as Boulder dam was completed in half the time. Month after month railways exceeded their previous records for hauling passengers and freight. By March 1943 Canada's output of war supplies was about 15% that of the United States though its population was less than 12% as large and its prewar state of industrialization very much less. During 1944 Canadian output tapered off a little because the anticipated requirements of the United Nations in some lines had already been reached and because the United States, which after Pearl Harbor had used Canada's already accelerated capacity as a source for certain goods in which its own program was not so far advanced, was now placing these orders at home. By the end of the war, Canada's own forces were using only 30% of the Canadian output of war supplies, the remaining 70% being sent to Britain, China, the U.S.S.R. and other countries.

This huge program was carried through by means of contracts placed with private industrialists. To get production under way, the original contract named a target price, normally the British price plus a small profit, and



Canadian naval repair station where craftsmen overhauled heavy naval guns during World War II

then as productive methods became more efficient, the manufacturer was allowed his costs plus 5% on his investment plus (as an incentive to keep costs down), a further percentage based on the spread between the target and actual costs. In cases where the government supplied the machinery, a management fee was paid the industrialist. Where a company used its own equipment which would have little or no postwar value, high annual depreciation charges could be included in the cost until the total capital was ultimately written off. To check on these contracts, several hundred government audits were continually carried on. Efforts were made to pool the best methods of all plants. Between 1940 and 1942, unit costs were reduced by from 30% to 50%. For example, Bren guns cost \$450 prewar, \$390 in early 1941 and \$192 in 1942. Though businesses made good financial returns during the war, there were no serious charges of profiteering.

Another technique used to handle the munitions program was the incorporation of Crown companies to operate publicly owned steamships, erect houses for war workers and produce or distribute artificial rubber, wool, scientific instruments, machine tools, uranium and so on. Capital was provided by the government, which also audited the books. For the most part, however, these companies were managed without detailed government interference, by business men who were familiar with this type of business organization and who could, in this way, escape government red tape and use their own initiative and accumulated skill.

The munitions program had to be tied in with price

control, the manpower situation, and the supply of scarce commodities. Also in order to prevent unwholesome competition for goods in tight supply, it had to be integrated with the constantly expanding war plans of the United States. In the early stages of the war, when U.S. industry was operating far below capacity, Canada could draw on the apparently limitless resources of that country for the goods which it could not provide. As physical and human resources came to be used more fully, the economies of the two nations, closely linked before 1939, had to be meshed so that the productive resources of both countries would be used to the maximum advantage in the common effort toward victory. This co-ordination was the task of a number of joint Canadian-U.S. boards, and daily, indeed hourly, consultation between "opposite numbers" in Ottawa and Washington.

Wartime Foreign Trade.—The control of foreign trade and exchange quickly intruded itself into the Canadian war effort. The flight of capital from a country which suddenly found itself at war; the conduct of trade with the axis, with axis-occupied territories and with enemy aliens in neutral countries; the export of commodities which were essential to the war effort of Canada and other United Nations; the need for retaining legitimate markets for Canadian goods abroad without discriminating unfairly against consumers at home—these and similar matters were handled by appropriate prohibitions or licensing arrangements.

The shortage of U.S. dollars was a more serious difficulty. Prior to the war, Canada had a very favourable balance of trade (values of exports of physical goods exceeded physical imports by value) with Great Britain and an unfavourable one with the United States. Through the mechanism of international trade, Canada was able without serious difficulty to use its surplus of pounds sterling to meet its deficit of U.S. dollars. After the start of hostilities Britain needed all the U.S. dollars it could possibly secure to pay for its purchases of military supplies and raw materials from the United States. The pounds Canada was acquiring in ever growing amounts because of increased exports to Britain could no longer be converted readily into dollars. At the same time, Canada's need for dollars in New York was mounting because of its expanding purchases in the United States of essential war supplies and of consumers' goods not produced at home. Though Canada sent a large part of its gold reserve to New York, the time fast approached when it might have to curtail its war effort because of the bottleneck of U.S. dollars.

To prevent this, a special excise tax was levied on imports from nonempire countries, importation of certain goods like washing machines was prohibited, travel by Canadians in the United States was drastically curtailed, the production and export of gold and newsprint to the states was encouraged since they supplied U.S. dollars in large amounts, and U.S. tourists were urged to come to Canada. Thus by increasing the flow of U.S. dollars into ·Canada and simultaneously cutting down on the demand for exchange for nonessential purposes, the situation was temporarily eased. When, early in 1942, the exchange problem again became acute, President Roosevelt and Prime Minister King agreed at Hyde Park that the United States should buy from Canada aluminum, ships and certain types of shells in which Canadian output was in advance of its immediate requirements and U.S. production was below its current need. These and other sales supplied Canada with the U.S. dollars needed to support its purchases of war goods in the United States. Even so, there could be no relaxation of the controls already established over foreign exchange, particularly after U.S. tourist spending in Canada disappeared.

The critical situation faced by Britain in the United States was dealt with by lend-lease. Materials were sent to Canada under lend-lease for incorporation within the dominion into aircraft and other goods which were sent on to other United Nations, but Canada itself never took advantage of lend-lease. The fiscal arrangements between the dominion and the United States remained throughout the war entirely on a cash basis.

Canada's prewar favourable balance with Britain mushroomed as exports of war materials and foodstuffs grew. Soon Britain faced a deficit of dollars in Montreal as well as in New York. In the first months of the war, Britain could send gold and securities to Canada to meet its purchases here. Later the dominion either made outright gifts to Britain to offset the deficit or paid for the goods with the understanding that the debt would be repaid by arrangements to be worked out after the cessation of hostilities. This aid-to-Britain was the Canadian counterpart of lend-lease and was supplemented, after May 1943, by mutual aid to soviet Russia, China and other countries. The monetary value of these Canadian arrangements exceeded the amount of lend-lease by the United States if differences in population and in the values of the respective dollars were taken into account.

War Finance.—Canada's finance during World War II

was a story of steeply rising taxes, huge victory loans, expanding national income, the drawing off of purchasing power in order to combat the threat of inflation and mounting public debt. By 1943 taxes had so increased that, to take one example, on a gross income of \$3,000 a single person paid \$824 in tax (prewar \$104), and on \$10,000, \$4,312 (prewar \$946). Victory loans, held twice annually, were oversubscribed, sometimes very heavily. National income rose from \$5,500,000,000 in 1939 to \$11,400,-000,000 in 1945. These data, being at current prices, were subject to some adjustment, 20% to 30%, for price increases. Nevertheless, the growth permitted the government to spend about 50% of the national income for war purposes and still leave the people with sufficient money, on the average, to raise their standard of living above pre-1940 levels. Early in the conflict, the government announced a pay-as-you-go policy of financing the war, but mechanized warfare was so expensive that in the later years only about two-thirds of the cost was financed by current taxes. The remainder was raised by borrowing and so, by March 1946, the dominion debt, direct and guaranteed, had risen from less than \$5,000,000,000 at the outbreak to \$17,300,000,000.

The financial and jurisdictional interrelationships of the dominion and the provinces were simplified during the war. In periods of real or apprehended emergency, the federal government had virtually unlimited powers of control and hence could legally regulate wages, hours, prices and other matters which under normal conditions clearly came under the provinces. In prewar days the provinces had been receiving an increasing proportion of their revenues from gasoline taxes and profits from the government monopoly of the sale of intoxicants. As a result of dominion wartime restrictions on these commodities, provincial revenues were endangered. Hence the federal government made special arrangements to pay the provinces additional subsidies in lieu of these temporary losses of revenue and the waiving, by the provinces, of their right to levy income taxes.

In order to build up a reserve against the unemployment which might be anticipated after the war boom collapsed, the dominion got authority to inaugurate unemployment insurance by going through the formality of asking the British-parliament to amend the B.N.A. act. The governments of Quebec, Alberta and New Brunswick protested that such an amendment required the unanimous consent of the provinces. Nevertheless a scheme of unemployment insurance went into effect in 1942. Three years later Canada began to pay family allowances, popularly called baby bonuses, on a scale graduated by age and the number of children in a family up to \$8 a month for each child under 16.

Economic Legacies of the War.—The conduct of World War II on the economic front required the effective working of a number of compatible policies all directed toward the same end and each contributing to the success of the others. The ultimate results were impressive. Canada's population remained less than that of New York state. Yet among the United Nations, Canada had the third largest navy and was fourth in air power. When war was declared, it had virtually no armament works, no production of large ships or large planes, no guns, no tanks. Thereafter its industrial capacity almost trebled to produce naval and merchant ships, warplanes ranging up to the 15-ton Lancaster bomber, military vehicles, and hundreds of other war items. In addition, food for civilians in Britain



Viscount Alexander listening to a welcoming address by Prime Minister King in the senate chambers at Ottawa after replacing the Earl of Athlone as governor general of Canada on April 12, 1946. The Earl of Athlone had succeeded Lord Tweedsmuir (John Buchan) upon the latter's death in 1940

and in Allied zones of occupation and essential raw materials like metals and lumber for use abroad in making munitions and erecting defense works were produced in huge quantities. Canada became the world's second largest exporter. The country actively participated in the development of the atomic bomb; it gave financial assistance corresponding to lend-lease to Britain and other United Nations totalling about \$4,700,000,000 and its expenditures for war on its own account involved more than \$15,000,000,000. An overall price ceiling, together with rationing, government subsidization of certain goods, controls of manpower, wages and war-vital materials, held down inflation and ensured equitable distribution. Finally, though Canada experienced strains on its national unity during the

war, it emerged from it with its national fabric relatively unimpaired—clearly an accomplishment for a country whose two predominant races differed so radically in their fundamental philosophy of life.

The war left Canada with an apparently distorted economic structure. Its productive capacity in steel had increased about 50% above 1939, in aluminum 5 times, in hydroelectricity 20%, not to mention magnesium, mercury, chromium, iron ore, shipyards, planes, chemicals, synthetic rubber, machine tools and instruments. In four years, 1941–45, about \$1,000,000,000 had been added to plant and equipment. A new industrial army had been recruited and valuable experience had been gained in methods of manufacturing. In aviation, the developments of many decades had been telescoped into a few years, and a merchant marine far beyond probable future needs had been constructed. Social services, including the new family allowances and unemployment insurance, had not been neglected.

The overbuilt industrial capacity of the country made foreign markets as important for manufacturing as for Canadian agriculture, lumbering, fishing and mining. Unfortunately, competition in the world market for manufactured goods remained extraordinarily keen, and Canada's training in selling abroad did not, during hostilities, kept pace with production techniques. In addition there was the acute danger of more or less persistent nationalism and the impoverishment of potential customers. In order to sustain Canadian exports temporarily, a British debt of \$425,000,000 was cancelled in 1946, an interest free loan of \$700,000,000 made in 1942 was extended to 1951, and a new loan of \$1,250,000,000 was made to Britain on terms similar to the contemporaneous assistance by the United States. Added to this were loans totalling \$750,000,000 to France, Belgium and the Netherlands as well as \$76,000,000 to U.N.R.R.A.

Sooner or later these makeshifts would have to be replaced by international trading on a normal basis or else the disastrous mistakes of the beggar-my-neighbour policy of the 1930s would be repeated. Foreseeing this, Canada co-operated fully in supplying money and technical experts in the various attempts—Bretton Woods, the International Monetary fund, the Food and Agricultural organization—to stabilize foreign exchange rates, provide purchasing power, raise nutritional standards and break the fetters of international trade generally. It enlarged its official agencies for making trade contacts abroad, set up an import branch within the government to help others sell in Canada, and made at least a start on tariff reduction by allowing free importation of agricultural implements.

Canada, moreover, was anxious to assist Britain solve its exchange problem. This was not merely an act of patriotism. Unless Britain, Canada's most important customer, could find a way to liquidate its obligations to India and Egypt and export goods and services in order to provide itself with dollars to make normally essential purchases in the United States, it would be forced to retreat within a sterling bloc. Should this occur, Canada would be faced with an exceedingly difficult question. Canada might tie its currency to the dollar of the United States but that country had not always given Canadian trading interests the consideration Canadians felt they deserved. On the other hand, Canada could make its dollar readily convertible only into the pound sterling, retain its chief export outlet but give up hope of meeting its obligations in New York on account of debt, and buy goods ordinarily imported from the United States from other, less satisfactory, sources. Foreign trade had a high priority.

Internally, certain direct legacies of the war had to be handled without delay. The extent of Canada's participation in the Pacific war had not been fully determined by V-I day, but the forces were being slowly reduced in size until September and then demobilized so rapidly that by June 1946 they were down to peacetime strength, about nine times the prewar number of 10,000. Former service personnel were treated generously in regard to postdischarge medical attention, clothing allowances, cash gratuities, rehabilitation grants to be used for buying a home or farm or individual business or for technical or university education, reinstatement by law in pre-enlistment civilian jobs without loss of seniority and hospitalization for the permanently disabled. Surplus war supplies of every conceivable type had to be sold for civilian use or scrap. The factories and machinery acquired, chiefly by the government, for munitions production were sold to private industrialists who, it was claimed, could readily convert at least two-thirds of them to producing civilian goods.

Commodity controls were quickly abolished except on timber and steel, in which acute shortages persisted. Consumer rationing of butter, sugar and meat was continued. Regulations regarding wages were kept in effect but they were steadily becoming more untenable because of strikes in steel, lumbering, inland water transport and other activities basic to speedy reconstruction in Canada or the relief of suffering abroad. The government was finding it almost impossible to hold a balance between preventing a dangerous inflation with an ultimate collapse, and precipitating an immediate contraction through the shortage of goods. Price ceilings were removed on a multitude of relatively unimportant articles, but the broad scheme was retained though obviously it could not be held indefinitely if wage control crumbled or strikes at home and abroad perpetuated wartime shortages of supplies. Some farmers refused to deliver goods for market until agricultural prices were permitted to rise with higher costs of living and of production. Big business was critical of alleged bureaucracy and the high cost of subsidizing some prices to keep them down. It wanted freedom to produce goods at a larger profit and thus, it claimed, maintain employment. Because of the shortage of houses, the control of rents and prohibitions against eviction of tenants were continued despite the inequities which they prolonged or created. The repeated attacks made on the government in 1946 during the passage of an act extending its emergency powers for one year emphasized the strong undercurrent of feeling against wartime restrictions. Late in 1946 the government began a further retreat from wage and price control.

Unemployment was not a serious matter in the 16 months after V-J day. Cutbacks caused by cancellations of orders by Britain and the United States had occurred as early as 1944, and on V-E day only about two-thirds as many were engaged in war production as at the peak in 1943. Civilian output to catch up with deferred demand by consumers or build up depleted inventories easily took up the slack in munitions plants, shipyards and the like. In addition, perhaps 400,000 married women, elderly persons or students quietly disappeared from the labour market. Agriculture and forestry continued to experience shortages of labour because of the greater isolation and poorer pay in these industries.

The government had attempted to anticipate postwar problems by setting up committees of the cabinet, of parliament and of citizens to study and propose definite lines of policy. In 1943 it created a separate department of reconstruction under Howe, who had handled the munitions program with such success. The government adopted the

maintenance of a high and stable level of employment and income as a primary object of policy. It proposed to attain this end by increasing domestic consumption, enlarging export markets, carrying out a broad program of social welfare, stimulating and encouraging private investment and creating a "shelf" of public works from which projects could be drawn for immediate construction should need arise. Many plans were based on the assumption of a relatively long period between the end of the war in Europe and in Asia. During this period substantially all the controls would still be in effect and it would thus be possible under government control of most of the economy to carry through a relatively smooth transition from war to peace. The sudden surrender of Japan catapulted the nation into a nominally peacetime world. Fortunately, business prosperity did not collapse as feared. It was sustained by heavy government expenditure for demobilization, rehabilitation and social security, by heavy consumer spending caused by deferment of demand during the war, by reconversion of capital facilities to peacetime use, and by a high level of foreign trade caused in part by government loans. The unsettling factors in the situationstrikes, rising costs, uncertainty in foreign trade, rumours of war and many more—raised misgivings about the future.

Dominion-provincial relations continued clouded. In Aug. 1945 the dominion proposed that the provinces withdraw from levying taxes on personal and corporate incomes and on estates in return for a federal subsidy based on population and national income. The dominion would assume responsibility for health insurance, conservation of natural resources, and for full employment and a high national income. However, the more prosperous provinces of Ontario, Quebec and British Columbia, while recognizing some responsibility for provinces with fewer resources and lower standards of social services, were reluctant to give up too many of their potential sources of revenue. Alberta considered that the plan would frustrate the Social Credit reforms. Quebec was suspicious that its cherished rights to its own language, religion and educational system might be endangered, particularly since the English speaking majority did not adhere to the prewar tacit agreement on conscription. Other provinces feared they would become mere pensioners of the dominion without real control over their affairs. Consequently, further discussion between the dominion and all the provinces collectively was postponed, and in late 1946 interim agreements were being made with some of the provinces individually.

Any federal state has to maintain a nice balance between centralization and states' rights or provincial autonomy. In Canada the basic problem was aggravated by an area large relative to population, by the divergent interests of various regions, and by racial divisions. Add to this the whole enormously difficult problem of the most satisfactory relation of the state toward economic life and of various nations with each other and it became obvious that it would not be easy for Canada to solve its postwar problems in spite of the demonstrated capacity of its people to handle the difficulties of war.

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Review, Canadian Journal of Economics and Political Science and Canadian Historical Review. J. F. Parkinson (ed.), Canadian War Economics (1941); A. F. W. Plumptre, Mobilizing Canada's Resources for War (1941) and C. Martin (ed.) Canada in Peace and War (1941) deal chiefly with the early war period. (A. W. CE.)

			Canada: Statistical Dat	,		
ltem	Value	Amount or	Value	Amount or	Value (000% arithad)	Amount or Number
Exchange rate Great Britain United States	(000's omitted)	Number 4.867 Canadian \$ =£ 1 Canadian dollar = 99.4 cents (free)	(000's omitted)	Number 4.45 Canadian \$=£1 1 Canadian dollar =87.3 cents (free) 90.9 cents (official)		4.45 Canadian \$ =£1 1 Canadian dollar =89.8* cents (free) 90.9 cents (official)
Finance Government revenues	£201,339 (\$984,345)		£196,647 (\$792,881)		£623,066 (\$2,514,072)	
Government expend-			£281,746 (\$1,136,000)		£1,199,214 (\$4,838,829)	
National debt	£719,908 (\$3,519,631)		£892,676 (\$3,599,269)		£1,969,151 (\$7,945,524)	
Transportation Railroads Highways		42,742 mi. 495,738 "		42,441 mi. 561,489 "		42,336 mi. 552,778 "
Navigáble water- ways		3,701 "		3,701 "		3,701 "
Communication Telephones Telegraph lines Radio sets		1,359,417 52,408 mi. 1,104,207		1,562,146 52,246 mi. 1,454,717		1,751,923 52,447 mi.‡‡ 1,759,100‡‡
Minerals Gold Copper		4,725,117 oz. 285,625 tons		5,345,179 oz. 321,658 tons		2,885,474 oz.§ 273,972 tons§
Nickel		105,286 '' 14,294,718 ''		141,124 " 18,225,921 "		137,607 '' \$ 17,118,008 '' §
Hay & clover Wheat		13,798,000 tons 10,800,300 " 5,942,112 "		12,632,000 tons 9,444,750 "		15,102,000 tons 13,066,000 "
Oats		2,453,808 "		4,889,200 " 2,643,584 "		7,994,288 '' 4,673,825 ''
Livestock Poultry		<i>57</i> ,23 <i>7</i> ,000 8,511,200		63,384,000 8,512,000		79,134,000 9,665,000
Swine		3,486,900 3,415,000 2,820,700		6,093,000 2,862,000 2,789,000		8,148,000 3,459,000 2,775,000
Forest products—Total. Pulpwood	3	6,306,747 cords		9,544,699 cords		8,801,368 cords
Logs & bolts Firewood Poles & piles Sea products		4,208,753,000 bd.ft. 9,026,080 cords 635,395		5,780,612,000 bd.ft. 8,612,037 cords 517,205		4,810,110,000 bd.ft. 9,210,346 cords 395,826
Salmon		88,336 tons 15,719 " 85,101 " 126,684 "		96,909 tons 13,901 '' 98,858 '' 139,263 ''		62,120 tons 15,055 " 107,759 " 161,332 "
Metal	£678,726 (\$3,318,289) £171,853 (\$840,190)	•••			£1,701,878¶ (\$6,867,079) £596,180¶ (\$2,405,586)	
Food	£158,363 (\$774,236) £108,430 (\$530,112) £50,982 (\$249,253)	•••			£1,701,878¶ (\$6,867,079) £596,180¶ (\$2,405,586) £281,498¶ (\$1,135,843) £216,704¶ (\$874,402) £85,826¶ (\$346,307)	•••
Exports—Total Newsprint paper	£21,274 (\$104,007) £18,179 (\$88,875)	2,425,000 tons 3,425,000 " 99,000 "	£350,976 (\$1,415,136) £33,421 (\$134,754) £35,045 (\$141,300) £14,654 (\$59,083)	3,262,000 tons 5,899,000 " 138,000 "	£725,993	3,059,000 tons † 9,890,000 " † 108,000 " †
rods, bars) Planks & boards	£8,465 (\$41,387) £7,298 (\$35,679)	209,000 tons 1,667,088,000 ft.	£9,385 (\$37,839) £15,571 (\$62,781)	214,000 tons 2,282,139,000 ft.	£7,241‡ (\$29,180) £22,304‡ (\$89,885)	129,000 tons ‡ 1,976,611,000 ft.‡
Imports—Total Crude petroleum Machinery (except		1,475,523,000 gal.	£302,777 (\$1,220,795) £12,235 (\$49,330)	1,965,564,000 gal.	£357,720‡ (\$1,441,612) £16,312‡ (\$65,736)	2,387,420,000 gal.‡
farm) Coal Rolling mill products.	£7,507 (\$36,702) £7,285 (\$35,618) £5,179 (\$25,322)	13,012,000 tons 531,000 "	£28,242 (\$113,872) £13,335 (\$53,765) £13,152 (\$53,029)	20,388,393 tons 845,000 "	£20,013‡ (\$80,653) £22,682‡ (\$91,409) £11,259‡ (\$45,375)	24,548,000 tons‡ 668,000 " ‡
Defense Standing army per-		4.000				,
sonnel		4,000 45,631		1 40,000¢ 1 00,000¢		493,000
sonnel		1,719 2,167		1 <i>5</i> ,0000		37,000‡
personnel Reserves Military expenditures	£6,609 (\$32,312)	1,987 993	£36,257 (\$138,865)	30,0009	•	167,858‡
Education Public elementary &	(**************************************		200,207 (\$130,000)		£1,018,376 (\$4,109,147)	
secondary schools. Enrolment		23,000¶ 2,029,482¶				
secondary school enrolment Indian school enrol-		123,062¶				
ment		18,000¶ 18¶				
Colleges Enrolment in universities & colleges		13 7 ¶				
*On Nov. 2, 1946, 1 Ca	nadian dollar equalled 95	103,696¶ cents. †Publication of	data suspended. ‡1945	5. §Preliminary figures	. [1943. ¶1942. ¢1940	·

Canadian Literature

Canadian literature during the decade 1937-46 showed many paradoxes when compared with the 1927-36 decade; there were fewer active writers but more writing, less paper but more books, fewer people with leisure but more reading, less contact with France but more French books. The 1937-46 decade also revealed a sharper sense of reality by Canadian writers, a truer focus of the nation's cultural energies, and a more acute awareness of fundamental issues on the part of the general public, than during the previous decade. These characteristics notably fostered and tempered the writing of the period.

Almost up to the impact of World War II, Canadian fiction had been preoccupied, with a few notable exceptions, by a nostalgic type of local colour in which the past was recreated romantically and sentimentally by writers who were antiquarians rather than social critics. These writers falsely imagined Canada as basically "habitant" or loyalist, or certainly provincial, and looked at Canada with introspective nationalism rather than extroverted nationalism.

They saw their country as an isolated phenomenon in the larger world, and thus saw it only partially if not inaccurately.

Although a change in outlook was becoming discernible just prior to World War II, the pressure of the war accelerated the process, and during the war Canadian literature became definitely cosmopolitan even when examining the dominion's own peculiar problems.

For instance, as one critic correctly declared, Earle Birney's narrative poem, David, published in 1942, depicted more than a particularized personal struggle to conquer a peak in the Rocky mountains; it was also an expression in universal terms of Canada's own national struggle to humanize its sometimes harsh and always impersonal environment. Gwethalyn Graham's novel, Earth and High Heaven, published in 1944, and Hugh MacLennan's novel, Two Solitudes, published in 1945, were deeply rooted in their local scenes of Montreal and Quebec and dealt penetratingly with specific local conditions; they also examined dispassionately but penetratingly problems of racial discrimination and religious intolerance that were world wide in scope.

The increase in quantity and the improvement in quality of Canadian writing during the 1937–46 decade, compared with previous decades, did not arise from any single cause, and certainly not from any single literary cause. A complex series of economic and political factors was the basis for the renaissance.

By the end of World War II, Canada had literally come of cultural age, with an entirely new feeling of national consciousness born of the war and Canada's participation in it. The desire for a Canadian flag and legislation defining Canadian citizenship were recognizable indications of this condition.

A distinctive Canadian spirit had emerged, and Canadian writers had learned how to express themselves in harmony with it.

Influence of Publishing.—Canada has two publishing centres, Montreal and Toronto, the former French and the latter English; and undoubtedly the economic effects of the war on the other major English-speaking publishing centres, New York and London, and the other French-speaking publishing centre, Paris, had much to do with

the 1937–46 expansion of Canadian publishing, which in turn influenced Canadian writing.

Increasing demand by British and U.S. readers for books by British and U.S. publishers cut into the supplies of potential exports of their products to Canada; and later the acute shortages of paper and labour further restricted export activities. Meanwhile, the Canadian reading public was expanding, and the English Canadian publishers were forced to depend more upon their own production efforts and less upon the import of books from London and New York to supply their markets.

During the decade, there were three firms publishing Canadian books in English for every firm doing so 25 years before. Moreover, the day of the 500 to 1,000-copy editions had gone. In the 1940s a Canadian publisher was not unduly alarmed when faced with a 10,000-copy edition; and, during the war years, many Canadian-produced titles of Canadian-written books sold more than 50,000 copies each, a phenomenon for Canadian publishing, compared with any previous period.

Furthermore, a reverse flow of books was set up. Instead of importing in large quantities, Canadian publishers began exporting in large quantities. In 1939, Canada exported bound and unbound books worth \$156,880; in 1945, Canada exported bound and unbound books worth \$1,027,700.

These figures revealed a new market not only for Canadian publishers but also for Canadian authors, and proved a direct stimulus to Canadian literature during the 1937–46 decade.

But providing an expanded market for Canadian books abroad was not the only way in which World War II stimulated Canadian writing; the market also expanded at home. Canadians had more to spend, because the per capita national income had increased from \$406 to \$675 in the decade. And while there was a shortage of many goods, there was a comparative abundance of books. Buyers turned to them. Moreover, books made ideal gifts for troops, and a generous wartime flow started in that direction,

There was another factor stimulating Canadian reading: Canadians, becoming more conscious of the role of Canada in world affairs, began studying its history and geography, its economics, its social and racial affairs, and all books relating even remotely to these subjects were eagerly sought.

Retail Canadian bookstores reported in 1945 that more than 30% of their total sales were of books published in Canada, whereas in 1935 the figure had been only 15%. The peak years of expansion in the Canadian book publishing industry were 1943, 1944 and 1945.

French-Canadian Publishing.—However, Canada is a land of two distinct cultures, and while Toronto was the centre of book publishing in English, Montreal was the centre of book publishing in French. During the 1937–46 decade, an astonishing expansion in Montreal publishing occurred.

Prior to 1939, except for school textbooks, religious books and some general books, French books were imported into Canada from Paris. In 1940, the flow of books from France to Canada was cut off. Booksellers were faced with the prospect of a book famine of indefinite duration. A unique step therefore was taken. The few active French-Canadian book publishers asked the Canadian custodian of enemy property to permit the publishing in Canada by special licence of French books, copyrighted in France and

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therefore normally protected by the Berne convention.

Under this arrangement, between the years 1940-44, the members of La Société des Editeurs Canadiens du Livre Français, which embraced all the major French-Canadian publishing firms, printed more than 1,600 titles, in which first editions were seldom less than 3,000 copies and often ran 5,000 copies. That method of reprinting French titles in Canada under the Emergency War Measures act came to an end on Jan. 31, 1946, a year after the resumption of Canada-France trade.

The stimulus to French-Canadian publishing was not without its very beneficial effects on French-Canadian literature. During the decade, while there were many French-Canadian written books of a general nature, liveliest interest was in the novel as a literary vehicle. It became a true art form, with a number of successful works in the psychological, historical and sociological fields.

Among the outstanding French-Canadian novels of the period, the following were representative: Ils Posséderont la Terre by Robert Charbonneau, a psychological story; Tentations by Gérard Martin, depicting the conflict between sin and grace; La Fin de la Joie by Jacqueline Mabit, depicting the tragic friendship of two girls; Les Opiniâtres by Leo-Paul Desrosiers, a historical novel of Three Rivers in the mid-17th century; Un Homme et son Pêche by Claude-Henri Grignon, a sociological novel of peasant customs and ethics in the Laurentides north of Montreal; Trente Arpents by Ringuet (pseudonym of Dr. Philippe Panneton), a story of the prosperity and later ruin of a Quebec peasant in the early 20th century; Le Survenant by Germaine Guèvremont, of rural life near Sorel; Au Pied de la Pente Douce by Roger Lemelin, of life in Quebec city; Bonheur d'Occasion by Gabrielle Roy, of the working classes in Saint-Henri district in Montreal during World War I.

English-Canadian Writers.—English-Canadian writing during the 1937–46 decade was, because of the active nature of the publishing market, complex and ramified. In fiction, poetry, general literature, juvenile literature and in the technical fields, Canadian writers turned out an amazing number of books, most of them of high quality. Of course, some of the writers active in that decade had been writing for years, while others broke for the first time into the charmed literary circle.

In 1946 Clara Thomas published a book called Canadian Novelists which, although not entirely satisfactory in scope, nor always accurate in detail, was nevertheless a useful handbook about Canadian authors active in the quarter century 1920–45. The book reported on some 120 writers, and an analysis revealed some amazing facts.

Of the writers listed, 12 of importance migrated to the U.S. or Great Britain before 1937, 16 died before 1937, and 10 others died during the 1937-46 period. Some of the latter were still in their creative prime, and their deaths were consequently sad blows to Canadian writing. There were novelists like Charles W. Gordon, L. M. Montgomery, Frederick Niven, Stephen Leacock; there were poets like Constance Davies Woodrow, Annie Charlotte Dalton, A. M. Stephen, Sir Charles G. D. Roberts; there were general writers like F. H. Howay, Arthur S. Morton, Emily Carr.

Another astonishing fact revealed by Clara Thomas's Canadian Novelists was that more than 30 Canadian authors who had, prior to 1937, written one or more books which had earned critical acclaim and had sold fairly well disappeared entirely from the literary scene. These 30 writers had published a combined total of more than 200

books, and their silence must always leave a large question mark in the minds of the critics surveying and analyzing the 1937–46 period. It is true that senility may have overtaken a few of them, but newspapers, advertising agencies, schools and colleges, civil service offices and even the stage, swallowed up most of them: at least there was money in those jobs, even if there was not enough money in writing!

An equally striking commentary on the impetus which Canadian writing experienced during the decade was the fact that, although about 30 creative writers lay fallow, almost exactly the same number of new writers of capacity or promise appeared between 1937 and 1946. Some of these initiates published first books in 1937 and 1938 but the larger number first appeared during the war years, and the greater percentage of the latter during the close of the war and just after it.

Not-Too-Productive Writers.—Some particulars of these two main groups of writers—those active before 1937 and remaining active thereafter, and those who came upon the scene after 1937—will do something to indicate the characteristics of Canadian literature in the period.

In the first group, Morley Callaghan had published two collections of short stories and five novels prior to 1937. In that year he published More Joy in Heaven, and then fell silent as a novelist, a victim of Canadian radio. Similarly, H. A. Cody, who had published 23 books prior to 1937, published only one more in that year, Storm-King Banner, an adventure novel, and then lapsed into silence. Ethel Chapman published two novels prior to 1937 and then published With Flame of Freedom in 1938 and in turn fell silent, preoccupied with the problems of an editorial desk.

These illustrations were not isolated: John Murray Gibbon, prolific as a novelist and nonfiction writer prior to 1937, published only one book thereafter, Canadian Mosaic, in 1938, and then became preoccupied with song writing. Madee Macbeth, novelist and playwright up to 1937, published Wings in the West in 1937 and devoted herself to feature journalism thereafter. Pearl Foley, mystery-story writer, Archie McKishnie, naturalist, and Frank J. Tate, sociological novelist were other examples of this unfortunate creative drought.

During the decade some writers produced but little in permanent book form. Leslie Gordon Barnard and Will R. Bird, both preoccupied with short-story writing, wrote only two books: the former a collection of short stories called So Near Is Grandeur and the latter a novel of early English immigration to Nova Scotia, called Here Stays Good Yorkshire. Two other one-book novelists were Mabel Dunham with Grand Valley, a story of the Mohawk wars in southern Ontario, and Ethel Kirk Grayson, Fires in the Vine, a story of pioneering along Lake Ontario.

Other writers making only a limited contribution were Allan Roy Evans with All in a Twilight, a novel of pioneering on the prairies; John Coulter with a biography of Churchill and Turf Smoke, a whimsical novel about an Irishman who lived in a New York penthouse; Jessie G. Sime with In a Canadian Shack and The Land of Dreams, the latter being a psychological study of dreams; William Strange, with Canada, The Pacific and War and Into The Blitz, the latter a personal account of blitz-torn London.

Backbone of Fiction.—But there were a number of major authors who were writing before 1937 and who continued to produce throughout the decade following. Frederick Philip Grove wrote two novels, Two Generations and Master of the Mill, and his distinguished autobiography, In Search of Myself. Nellie McClung wrote More Leaves from Lantern Lane and The Stream Runs Fast, both auto-

biographical in content. Philip Child produced a mystery story, *Blow Wind*, *Come Wrack*, and a serious fictionalized study of dictatorship, *Day of Wrath*. Denis Conibear wrote two adventure novels, *Northward to Eden* and *Husky*.

Even more prolific "old timers"—writers well established by 1937—were William Lacey Amy (Luke Allan), Louis Arthur Cunningham, Mazo de la Roche, Maurice Dix, Frederick Niven, Laura Goodman Salverson, Arthur Stringer and Alan Sullivan.

These eight writers were really the backbone of Canadian fiction during the 1937-46 decade, producing a total of more than 50 books. Their more significant publications in the period were as follows: William Lacey Amy: Ghost Murder, Blue Pete: Horse Thief, Beyond the Locked Door, Vengeance of Blue Pete, The Tenderfoot; Louis Arthur Cunningham: Moon Over Acadie, Valley of the Stars, Discords of the Deep, Of These Three Loves, Sign of the Burning Ship, Marionette; Mazo de la Roche: The Very House, Growth of a Man, The Sacred Bullock, White Oaks Heritage, Wakefield's Course, The Saplings, The Building of Jalna, Quebec (not a novel), The Return of Jalna; Maurice Dix: The Kidnapped Scientist, The Fixer, Beacons of Death, This Is My Murder, Prologue to Murder, Murder Strikes Twice, Night Assassin; Frederick Niven: The Staff at Simpson's, The Story of Their Days, Mine Inheritance, Brothers-in-Arms, The Transplanted; Laura Goodman Salverson: The Dark Weaver, Black Lace, Confessions of an Immigrant's Daughter; Arthur Stringer (considered in the main stream of Canadian literature, though resident in the U.S.): Heather of the High Hand, The Lamp in the Valley, The Dark Wing, Ghost Plane, Intruders in Eden, Star in a Mist, The Devastator; Alan Sullivan: The Man at Lone Tree, With Love from Rachel, The Fur Masters, Cycle of the North, Three Came to Ville Marie, And From That Day, Cariboo Trail.

New Writers.—But while some Canadian writers were lying fallow during the 1937–46 decade, while some were passing permanently from the literary scene, and while some were shunted into nonliterary preoccupations, new and vigorous writers were rising. These could be divided into three groups: those who were part of the normal evolution of Canada's creative writing, those who were brought to the public eye partly as a result of the wartime boom in publishing, and those who joined the parade in the postwar part of the decade as a result of the continuing stimulus.

Among the important writers in the first category was Angus Mowat, who wrote Then I'll Look Up in 1938, and followed with Carrying Place in 1944, both powerful psychological novels. W. G. Hardy also came on the scene in 1938 with Turn Back the River, following in 1942 with All the Trumpets Sounded, both being historical novels of Biblical times. Another 1938 arrival was Gwethalyn Graham with Swiss Sonata, the setting of which was laid in a Swiss boarding school; a success which she followed in 1944 with an even more outstanding work, Earth and High Heaven, a novel of religious intolerance. Irene Baird was still another early arrival of the decade, with a light romantic story called John in 1937, which she followed with Waste Heritage in 1939, a vigorous novel of labour strife. In 1941 she published He Rides the Sky, a novel of World War II.

Much interest centred on the writers whose arrival on the literary scene was prompted by or coincided with the war. In the brief period some of them published as many as five books, and obviously were long-distance writers; others published only one or two books, and while critics regarded their appearance with enthusiasm, judgment regarding their creative staying powers was reserved. Among these latter were such novelists as Herbert Sallans, *Little Man*; Mary Quale Innis, *Stand On a Rainbow*; Wilfrid Eggleston, *The High Plains*; Judith Cape (pseudonym of Patricia K. Page), *The Sun and the Moon*.

Critics were free with their praises, and equally free with their expressions of doubt about staying qualities, when they examined the works of James F. C. Wright, Dyson Carter and Maude Hill Beaton. In the period Wright wrote Slava Bohu, a full account of the life of the Doukhobors in Canada, and All Clear, Canada, a personal report of a trip to England during World War II; Carter wrote Sea of Destiny, an analysis of the military strategic role of Hudson bay, and Night of Flame, a novel with scenes laid in a hospital; and Miss Beaton wrote From Cairo to Kyber to Celebes, a travel book, and Keep Your Quilt, Mary Anne, a novel of life on Great Manan Island, off the coast of New Brunswick.

The critics were lavish both in praise and in their certainty of further good work from Thomas Raddall, Hugh MacLennan, Dorothy Dumbrille, Bruce Hutchison, Franklin D. McDowell and Grace Campbell. In the period Raddall wrote two books of short stories, Pied Piper of Dipper Creek and Tambour, and three historical novels about Nova Scotia, His Majesty's Yankees, Roger Sudden, Pride's Fancy; Hugh MacLennan wrote a novel about Halifax during World War I, Barometer Rising, and a novel studying religious intolerance in Quebec, Two Solitudes; Dorothy Dumbrille produced two books of poems, Watch the Sun Rise and Stairway to the Stars, and a novel, All This Difference, about Quebec; Bruce Hutchison wrote Unknown Country, an impressionistic study of Canada as a nation, and Hollow Men, a novel about politics in Canada's capital; Franklin McDowell wrote two historical novels, The Champlain Road, about early missionary activity in Ontario, and Forges of Freedom, the central theme of which was the Watt Tyler revolt in England.

A literary phenomenon of this period was Emily Carr, retired British Columbia painter and artist, who wrote four autobiographical books, the latter two of which were posthumously published. The books were Klee Wyck, The Book of Small, The House of All Sorts and Growing Pains.

In 1944 there was one major new Canadian novelist, John MacDonald, whose Darkly the River Flows won a U.S. literary prize. In 1945, two new women writers appeared: Violet King, with a historical novel of Ontario in 1837, Better Harvest; and Grace Tomkinson, with a novel of English-French relations in Quebec, Her Own People.

In 1946, however, the flood came: no less than eight new novelists, nearly all of them young people, appeared on the Canadian literary scene. They and their works were Ralph Allen, Home-Made Banners; Constance Beresford-Howe, The Unreasoning Heart; Eric Cecil Morris, A Voice Is Calling; Lillian B. Thomas, New Secret; Joyce Marshall, Presently Tomorrow; W. O. Mitchell, Who Has Seen the Wind; Marion Greene, Down River Lies the World; Winnifred Bambrick, A Continental Review. Much was expected of these first novelists.

Nonfiction.—During the war period, of course, there were many books specifically relating to the war, both by new and by experienced writers. The more impressive of these were Wallace Reyburn's Glorious Chapter, Isabel Guernsey's Free Trip to Berlin, Amea Willoughby's I Was

on Corregidor, Leslie Roberts' Malta Spitsire, Matthew Halton's Ten Years to Alamein, William G. Carr's Checkmate in the North, L. B. Shapiro's They Lest the Back Door Open, D. F. Griffin's First Steps to Tokyo, Ross Munro's Gauntlet to Overlord, Leo Heaps' Escape from Arnhem, W. H. Pugsley's Saints, Devils and Ordinary Seamen, Grant Macdonald's Sailors. Edgar McInnis wrote six invaluable books covering the war year by year.

Most impressive general nonfiction of the period of the 1937-46 decade, besides the books above mentioned, were My Discovery of the West by Stephen Leacock, The Canadians by G. M. Wrong, Postscript to Adventure by C. W. Gordon (Ralph Connor), Two Ways of Life by W. J. Lindal, Persons, Papers and Things by Paul Bilkey, Canada, Europe and Hitler by Watson Kirkconnell, The Canadian Peoples by B. K. Sandwell, Never a Dull Moment by Kathleen Strange, Cape Breton Over by Clara Dennis, The Unguarded Frontier by Edgar McInnis, Friendship by Harry Symons, The Incomplete Anglers by John Robins, Sir Charles G. D. Roberts by Elsie Pomeroy, On Canadian Poetry by E. K. Brown, Partner in Three Worlds by Dorothy Duncan.

A number of significant collections of poems were published during the decade, chief of which were The Tree of Resurrection and Challenge to Time and Death by Audrey Alexandra Brown; The Fable of the Goats, Brebeuf and His Brethren, Collected Poems, by E. J. Pratt; The Legend of Lost Lagoon by Joseph Schull; River Without End by Leo Cox; By Stubborn Stars by Kenneth Leslie; The Wind Our Enemy and Calling Adventurers by Anne Marriott; Under the Sea by Arthur Bourinot; Personal Note and Grey Ship Moving by Charles Bruce; David and Now Is Time by Earle Birney; Who Dare to Live by Frederick V. Watt; News of the Phoenix by A. J. M. Smith; Night and Day by Dorothy Livesay.

During the 1937-46 decade the beginning of an impressive collection of Canadian juvenilia was well advanced. The more important items included Starbuck Valley Winter by Roderick L. Haig-Brown; A World of Our Own, Danger on the Coast and Canada and Her Story, by Mary G. Bonner; The Cruise of the Mamie L. by Helen Dickson Reynolds; By Paddle and Saddle by Olive Knox; Jory's Cove by Claire Bice; Sugar Shanty, Lefty and Lefty's Adventure by Louise R. Rorke; Arctic Adventure, Dark Treasure and Mystery Ship by William MacMillan; Jess by T. Morris Longstreth; Just Mary and Maggie Muggins by Mary Grannon; Swampy Cree Legends, Young Voyageur, Fur Trade Apprentice and Phantom Fur Thieves by Charles Clay.

Awards for Literature.—The effect during the 1937–46 decade of awards for Canadian literature was important. Most distinguished of these, even though they did not carry any monetary value, were the governor-general's annual literary awards, under the jurisdiction of the Canadian Authors' association. They were first given in 1937 for the best books published the preceding year. They were awarded annually throughout the entire decade, and consisted of a bronze medal in the fiction, poetry and general literary categories until 1943, when the general literature category was divided into creative nonfiction and academic nonfiction, making four medals. In 1943, because bronze was in short supply, silver was used for the medals.

In 1946, steps were taken to add a medal for the best juvenile book of the year. Other annual medals donated throughout the period included the Canadian Women's Press club gold medal, the Lorne Pierce gold medal, the Royal society gold medal for literature.

The only monetary awards of any significance were the Ryerson Press Annual All-Canada Fiction award, inaugurated in 1942 for \$500 and raised to \$1,000 in 1943. In the province of Quebec there were provincial prizes called the David prizes for English and French fiction, poetry, drama and general literature. These ran in value from \$600 to \$1,200.

Such literary awards did much to stimulate 1937-46 writing: the publicity given to the winning books, both in Canada and the U.S., resulted in good sales and provided incentive to Canadian writers.

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Canadian-U.S. War Committees

Before World War II, relations between the United States and Canada were based less on common institutions than on the constant interchange of population, tourists, books and movies, across an unguarded and everpeaceful frontier. Wartime co-operation between the two countries arose from the desperate situation facing the world in 1940, when German power had swept through western Europe to the very shores of the Atlantic. It was based on the urgent necessity for curbing the aggression of the axis powers and concerting plans for the defense of the northern part of the western hemisphere. On Aug. 17, 1940, 11 months after Canada declared war on Germany, President Roosevelt and Prime Minister King signed the Ogdensburg agreement which brought into being the Permanent Joint Board on Defense. As a result of the Hyde Park declaration of April 1941, which recognized the need for further measures to co-ordinate the productive facilities of both countries if the utmost aid were to be given to the United Kingdom and the other democracies, the Materials Co-ordinating committee, the Joint Economic committees and the Joint War Production committee were established. The Joint Standing Committee on Agriculture and the Joint War Aid committee were not set up until March and Aug. 1943, respectively.

Permanent Joint Board on Defense.-It was clearly intended that this board's functions should extend beyond immediate wartime needs and should constitute the permanent advisory instrument for planning the defense of both the United States and Canada in the postwar period. Even before the United States entered the war, joint Canadian-U.S. measures were taken for the defense of the northwestern approaches of the North American continent. After Pearl Harbor a policy of the closest co-operation among all the armed services of Canada and the United States was initiated. The over-all plans for the defense of North America were drawn up by this board and implemented by the two governments. Recommendations of the board resulted in the building of the Alaska highway, the construction of a chain of air fields between Edmonton and Alaska, and construction of other operations in Labrador, Newfoundland and Alaska by U.S. and Canadian civilian and military forces. After the end of World War II, the United States and Canada continued to co-operate on joint defense measures against

any future attack, particularly across the Arctic regions.

The United States and Canada also co-operated closely in liquidating their joint wartime ventures, particularly the air route between the U.S. and Alaska and the installations connected with it. The Alaska highway, airfields and telephone lines were taken over by Canada on April 3, 1946. Canada paid for every permanent air facility installed by the U.S., and the United States did not request postwar bases on Canadian soil.

The Permanent Joint Board on Defense was set up with six U.S. members (four representing air, ground and navy forces, one the department of state and one acting as civilian chairman) and five Canadian members (representing parliament, air force, army, navy and department of external affairs).

Materials Co-ordinating Committee.—This committee was established on May 1, 1941, shortly after the Hyde Park declaration, to plan the over-all raw material supply and requirements program of the two countries and to iron out distribution problems arising from short supply. It was the agency which formally presented Canada's position to the Combined Raw Materials board. The three U.S. members represented the War Production board and the three Canadian members, the department of munitions and supply. The committee officially went out of existence on Dec. 31, 1945.

Joint Economic Committees.—Establishment of these committees was announced June 17, 1941. They were to harmonize economic controls, priority regulations, shipping problems, questions of tariff, duties and exchange, and generally to mesh production in both countries for the most effective prosecution of the war. Exploratory discussion of postwar problems led to the initiation by the committees of a joint Canada-U.S. study of the North Pacific area including Alaska, the Yukon territory and northern British Columbia. The project was announced on Jan. 25, 1943, and was to study the possibilities for the economic development of the region in the light of wartime changes and for the benefit of the two countries and the welfare of the inhabitants of the area. These committees were dissolved in March 1944, when it was apparent that other agencies had taken over most of their functions.

Joint War Production Committee.—This committee was first set up in Nov. 1941 as the Joint Defense Production committee by President Roosevelt and Prime Minister King pursuant to an earlier recommendation of the Joint Economic committees. The objective of the committee was to integrate and speed up munitions production in both countries. It was successful in reducing duplication, increasing the exchange of technical information, closing short-term gaps, and in rationalizing production to take advantage of the best facilities available in both countries. Ten technical subcommittees did the basic groundwork for the committee. These expert bodies covered aircraft, artillery, artillery ammunition, conservation, chemicals and explosives, small arms and small arms ammunition, naval shipbuilding, merchant shipbuilding, signal corps equipment and tank automotive. The eight Canadian members represented the department of munitions and supply and the department of external affairs while the seven U.S. members were from the War Production board, the war and navy departments, the air force, the Maritime commission and the Foreign Economic administration. The dissolution of this committee was formally announced by the two countries on Jan. 12, 1946.

Joint Standing Committee on Agriculture.—This committee was set up in March 1943 to keep in constant review agricultural and food production and distribution in

the light of war and civilian needs at home and in liberated areas. There were four U.S. members representing various agricultural and food agencies, while the four Canadian members were representatives of the department of agriculture and the Wartime Price and Trade board. This committee became inactive in Oct. 1943, when full membership on the Combined Food board was extended to Canada.

Joint War Aid Committee .- During the Quebec conference in Aug. 1943, President Roosevelt and Prime Minister King announced the formation of this committee. Its purpose was to consider problems arising out of the operations of Canada's Mutual Aid plan and United States lend-lease. It examined all calls for assistance on these agencies in order to prevent overlapping or duplication and kept each other informed on current commitments. The five U.S. members were from the departments of state and war, the War Production board, the Munitions Assignment board and the Office of Lend-Lease administration, and the six Canadian members represented the Canadian section of the Combined Production and Resources board, the Canadian embassy in Washington, the Canadian joint staff, the Wartime Prices and Trade board, the department of munitions and supply and mutual aid. Since the purpose of this committee was to study problems arising out of the operations of United States lend-lease and the Canadian Mutual Aid programs, its operations ended with the termination of these programs early in Sept. 1945. (See also British-U.S. War Boards.) (W. E. TH.)

Canadian Women's Services, World War II

World War II saw the organization of three Canadian women's military services, complementing the royal Canadian air force, the Canadian army and the royal Canadian navy. These were the royal Canadian air force (women's division), commonly called the "W.D.'s"; the Canadian women's army corps, nicknamed the "CWAC's" (pronounced "quacks"); and the women's royal Canadian naval service, popularly known as the "Wrens." These services were vital to the Canadian war effort because they freed for other duty clerical and similar ranks from the various men's services.

The W.D.'s.—The R.C.A.F. women's division was the first to organize, in July 1941, and before disbanding in Aug. 1946, it reached a total enlistment of 17,038. The W.D.'s were also the first to go overseas, 1,470 serving in that capacity, mostly in the United Kingdom. Many were assigned to the R.C.A.F. bomber group when it was organized in Jan. 1943.

The slogan of the R.C.A.F. women's division was "She serves—that men may fly." The service was an integral and component part of the R.C.A.F. itself, and all organization and administration was dovetailed, thus, eliminating duplication of records, authority and work. But the W.D.'s had their own officers and noncommissioned officers to supervise them and look after their welfare and health.

Rookies received five weeks' basic training at a manning depot, where they were issued uniforms, inoculated, taught to drill and march, given physical training, and learned service etiquette and service history. Special technical training was carried on at more than 100 other establishments scattered throughout Canada.

When first organized, the R.C.A.F. (W.D.) trained recruits in ten trades; at the peak of operations it was training them in 43. They became cooks, hospital assist-

ants, clerks, telephone operators, drivers, wireless operators, laboratory assistants, photographers, dental assistants, signal officers, equipment and accounting officers and messing officers. At air force headquarters in Ottawa, during the height of the manpower shortage, many men officers' positions were filled by women officers. On the majority of R.C.A.F. stations a W.D. officer was assistant station adjutant.

In the control towers of R.C.A.F. flying depots, W.D. meteorological observers charted the weather, airwomen in the flights checked the pilots "in" and "out" and kept a close record of their flying hours. In the equipment sections they handled engine parts. In the stores sections they gave out uniforms. In the maintenance hangars they repaired wing fabrics and worked on the engines. In the parachute sections they packed 'chutes.

The W.D.'s played a vital part in the Canadian defense system. The duty of keeping check on the position and course of every aircraft which approached Canada's North Atlantic coast was entrusted to clerks-operational.

As a consequence of duty well done, 13 W.D.'s were invested by the king with membership in the Order of the British Empire, 21 were awarded the British Empire medal and 40 were mentioned in dispatches.

CWAC.—The Canadian women's army corps was the second women's service to be organized, in Sept. 1941. By the time it was disbanded, in Sept. 1946, a total of 21,614 women of ten nationalities and four races had served, 1,907 of them in the United Kingdom, Italy and northwest Europe. Others had served in Newfoundland and in the United States. There had been companies, platoons or detachments in practically every military centre in Canada.

Contingent of the women's royal Canadian naval service saluting the Earl of Athlone, then governor general of Canada, during the ceremonies marking V-J day in Ottawa The slogan of the CWAC's was "Release a soldier for active service," and, as in the other women's services, recruits enlisted for the duration of the war plus one year. The corps had the same standing as any corps of active militia in the Canadian army, and it was the first time in the history of any army that women achieved a status equal with men. They took the same oath of allegiance, came under the same rules and regulations, and enlisted for service in any part of the world. They got trades pay and dependents' allowances on the same scale as male recruits. Besides basic training, the CWAC's received special courses in such subjects as photography, drafting, architecture, cartography, meteorology, radio, radar and film projection.

They served in about 50 different capacities, including clerks, laboratory technicians, drivers, orderlies, cipher clerks, wireless operators, recruiting officers, cooks, stenographers, waitresses, superintending clerks, draftsmen, mechanics, radio instructors, instrument mechanics, dental chair assistants, postal soiters and signals operators. It was a high compliment to the Canadian women's army corps that, when the United States army decided to organize a women's army corps, it used the Canadian service as its model.

Outstanding acts of heroism or application to duty won individual members of the corps the plaudits of the civilian population and recognition from the king of England; 62 CWAC's received appointments as officers or members of the Order of the British Empire, or received awards of the British Empire medal: 16 were mentioned in dispatches.

Wrens.—The women's royal Canadian naval service was organized in June 1942. By the time mustering out was reached on July 31, 1946, 6,783 women had served. Of these, 450 had been to England and Scotland, 450 to naval establishments in Newfoundland, 50 to New York



The Wrens were closely modelled on the women's royal naval service in Great Britain but they were not, like the British, merely an auxiliary service. They were an integral part of Canada's naval service, and Canadian

Wren officers were granted the king's commission and given naval rank rather than the British designations of superintendent, chief officer, first officer and so on.

The Wrens were given basic training aboard H.M.C.S. "Contestoga," which was operated in the traditions of all other land establishments of the royal Canadian navy. Located at Galt, Ontario, it was commissioned in Oct. 1942 as a training ship in the royal Canadian navy. It was unique not only in Canada but also in the British empire, as the first and only ship captained by a woman. The only male personnel on board were the stokers, a shipwright and plumber.

Organized to serve in clerical, administrative and domestic capacities, the largest group of Wrens consisted of general duty writers (naval term for office workers), and numbers of others served as messengers, messwomen, wardroom attendants and cooks. Wrens became motor transport drivers, laundry assistants, teletype operators, visual signallers, wireless operators, coders, sick berth attendants, sailmakers, operational plotters, draftsmen, training assistants and electrical artificers.

As the manpower shortage grew, the demands upon them increased greatly, with many of the girls filling posts vital to the success and safety of Canadian warships in the battle areas. A special detachment worked with the technical research establishment of the royal Canadian navy at Halifax, Nova Scotia.

Wrens manned the lonely and secret wireless stations which kept tab on the movements of U-boats in the Atlantic; from the high and wind-whipped signal posts overlooking the Atlantic they directed warships into and out of port; on enormous charts in operational headquarters of the various Canadian bases they plotted the movements of warships and convoys; in night action rooms they taught sea-going naval personnel the latest tactics and methods in the war against nazi U-boats.

For special work in the line of duty, three Wrens won the Order of the British Empire, seven the Member, Order of the British Empire, ten the British empire medal, and two won commendations.

THE MORALE of all the Canadian women's services remained high throughout World War II. The W.D.'s, the C.W.A.C.'s, and the Wrens kept in mind that by undertaking their military service they were freeing enlisted men of high health category for combatant or other duty, and in the days when Canadian manpower shortages were particularly acute that was essential. The success of the various Canadian women's services was measured in terms not only of the final victory they helped achieve, but also in terms of the high regard in which they were held by the men they released from office, ground and shore duty. And, finally, upon demobilization the Canadian government awarded the members of the women's services with gratuities and other re-establishment benefits on a par with the men of the armed forces.

Speaking to a military review on Canada's Parliament hill Aug. 28, 1946, Field Marshal Bernard Montgomery paid tribute to the Canadian women's services: "The contribution to the war by Canadian women was terrificabsolutely! The name of the Canadian women's services SERVICES, WORLD WAR II.) BIBLIOGRAPHY.-C. E. Whitton, Canadian Women in the War

stands very high in Britain." (See also British Women's

Effort (1942); Canadian Geographical Journal (Nov., Dec. 1943, Nov. 1944).

Canals and Inland Waterways

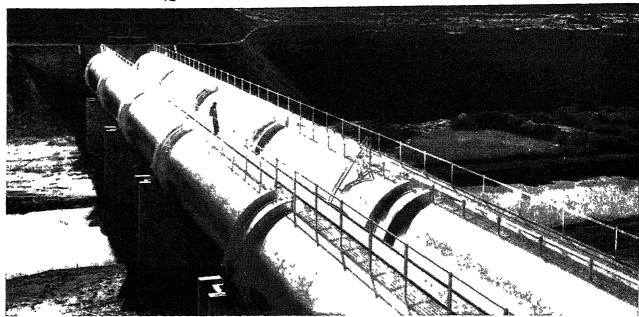
During the decade 1937-46, improvement and construction work on U.S. canals and inland waterways, most extensive in the world, was given great impetus by the nation's wartime industrial production. Not only did the inland and protective coastal waterways relieve the railroads of their overburden, they also afforded a means of coastwise waterway transportation that did not run the hazard of submarine attack. In addition to their value as carriers of commercial cargo, the inland waterways were used during World War II to float hundreds of seagoing vessels from newly constructed inland shipyards to the ocean. Shipyards and dry docks were constructed at points on the Mississippi, Illinois, Missouri, Tennessee, Cumberland and Ohio rivers, as well as on the Great Lakes. In the three years and nine months of war, these shipyards produced 3,943 war vessels of various sizes and descriptions, and 146 dry docks.

Channel improvements, for connecting channel construction along the rivers, bays, inlets, lakes and bayous of the Atlantic and Gulf coasts, gave the United States an inland waterway extending 2,300 mi., from New Jersey almost to the Mexican border. In 1936, traffic on the major canals and inland waterways totalled 276,300,000 tons. In 1944, traffic had increased to a total of 402,731,000 tons. During the years 1936 through 1945 (the last year for which figures were available at the end of 1946) traffic totalled 3,600,816,000 tons.

Principal commodities transported continued to be coal and coke, iron and steel, petroleum products, cement, sand and gravel, bauxite, cotton and grain. Other commodities moving in large amounts were sugar, molasses, coffee, sisal and sulphur. The industrial areas at St. Paul and Minneapolis received barge shipments from Alton, Ill., and terminals on the Illinois waterway, which connects the Mississippi with the Great Lakes. One of the largest increases in traffic on the Mississippi river system was the movement of petroleum products from refineries in the St. Louis area to Minneapolis, St. Paul, LaCrosse, Burlington and other consuming and distributing centres on the upper river. New movements of gasoline and fuel oil from Louisiana and Texas refineries to St. Paul and Minneapolis were developed in 1940. Other new developments in petroleum traffic were movements of gasoline from Lockport to East Peoria and from East St. Louis to Kingston mines. The transportation of gasoline from refineries in Texas via the Intracoastal waterway, Mississippi and Ohio rivers, Pittsburgh, destined for the Atlantic coast, was inaugurated to alleviate the shortage caused by diversion of coastwise tankers that formerly supplied that area.

Principal waterways in the United States were divided by the corps of engineers, U.S. army, into the Intracoastal waterways, inland waterways and Great Lakes connecting channels.

Intracoastal Waterways.-The Atlantic and Gulf Intracoastal waterways provide a protected channel for barge and other light-draught navigation following coastal sounds, bays, rivers and artificial channels. This canal system, extending for more than 2,300 mi. along the Atlantic



Sectional siphon of the All-American canal where it bridges a natural river near Calexico, Calif.

and Gulf coasts, afforded a channel 12 ft. or more in depth throughout the Atlantic coastal section from Trenton, N.J., to Jacksonville, Fla., and on the Gulf coastal section from Carrabelle, Fla., to Corpus Christi, Tex. Important coastal canals at the end of the decade included the Cape Cod canal, Mass., and the Chesapeake and Delaware canal, maintained and operated in the interest of ocean-going vessels.

Inland Waterways.-The principal inland navigable waterways of the United States at the end of the decade included the Mississippi river, the Illinois waterway, the New York state barge canal system, the San Joaquin-Sacramento river system in California and the Columbia river system in the northwest. The Mississippi river waterway embraced the river proper, the Illinois, Ohio, Tennessee, Monongahela, Allegheny, and Kanawha rivers and other streams. The Mississippi river had a channel suitable for ocean-going vessels upstream to Baton Rouge, La., and thence a channel for modern barge navigation to Minneapolis, Minn., and others in its principal tributaries. The Illinois river and waterway to Lake Michigan had a barge channel connecting the Great Lakes with the Mississippi river system. The San Joaquin-Sacramento river system, with an outlet to the sea through San Francisco bay, provided a deep-draught channel to Stockton, Calif., on the Sacramento river. The Columbia river had a deep-draught channel to Portland, Ore., and Vancouver, Wash., and depths suitable for commercial vessel traffic to the head of the pool formed by the Bonneville dam, and thence depths for barge navigation upstream to and including the Snake river. Lake Washington ship canal, Wash., provided a channel for ocean-going vessels within the city of Seattle extending from Puget Sound to Lake Washington.

Great Lakes Connecting Channels.—The Great Lakes have natural deep waters except in the connecting channels, artificially deepened where necessary to accommodate deep-draught vessels. They have an outlet to the Atlantic ocean via the St. Lawrence waterway and via Oswego and Erie branches of the New York state barge canal system and Hudson river. The connecting channels at the end of the decade were Keweenaw waterway, Lake Superior to Keweenaw bay; St. Mary's canal, Mich., between Lake Superior and Lake Huron; channels in the

Straits of Mackinac, connecting Lakes Michigan and Huron; Sturgeon bay and Lake Michigan ship canal, between Green bay and Lake Michigan; St. Clair river, between Lakes Huron and St. Clair; channels in Lake St. Clair; and Detroit river, connecting Lake St. Clair and Lake Erie. In addition, the Welland canal in Canada connected Lake Erie and Lake Ontario.

Traffic on Major Canals and Inland Waterways of the U.S., 1936-45
(Thousands of tons of 2,000 pounds)

							٠,		~ ~.		,					,			
Year																	Total	Bulk	Package
1936																	276,300	255,500	20,800
1937																	313,300	289,500	23,800
1938																	277,800	254,000	23,800
1939							٠	٠	•	٠	٠		٠	•	٠	•	329,400	303,600	25,800
1940					•	•	٠	٠	•	٠	٠	•	٠	٠	٠	•	366,800	324,900	23,900
1941		-	-	-				٠									427,223	403,299	23,924
1942	•	•	-	•	-	-	-	٠	_	-	-	-			-		423,336	402,170	21,166
1943								٠									389,722	374,133	15,589
1944	•	٠	٠	٠	٠	٠	٠	٠	٠	٠	•	٠	٠	•	٠	•	402,731 394,204	385,61 <i>5</i> 374.874	17,116 19,330
1945	٠	٠	•	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	•	374,204	3/4,0/4	17,330

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Great Britain.—The geographical and physical conditions of Britain are unfavourable to any large development of inland water transport in competition with rail and road haulage, and little was done further to develop this form of transport after the report of the royal commission on canals and inland waterways was issued in 1909. During 1937–46, new construction was on a very small scale. In 1905, the traffic carried on British inland waterways was 42,000,000 tons. It diminished rapidly up to 1926. Later the annual figures remained fairly constant until 1938, averaging about 15,000,000 tons (excluding

Manchester ship canal traffic). During the years of World War II, traffic originating on the waterways declined to an average of about 11,000,000 tons annually for the years 1940–45 inclusive; the figure for 1945 fell to just over 10,000,000 tons despite efforts to utilize water transport fully as a relief for traffic congestion on the railroads. Shortage of manpower alike for operating barges and for building and repairing them severely restricted the use made of the waterways during the war years. In July 1942, the government took control of the canals.

British Commonwealth.—Apart from Canada, the improvement of rivers and the construction of canals for navigation in the British empire was relatively insignificant compared with such developments as took place in Europe. Between 1937 and 1946, some further progress was made in Australia with the opening up to navigation of the Murray river (New South Wales and Victoria).

In Burma the Irrawaddy and its chief tributaries form important waterways. The main stream is navigable beyond Bhamo, goo mi. from its mouth, and carries much traffic. In India, the system of artificial canals, constructed mainly for irrigation and flood control, was used only to a very limited extent for transport.

Canada.—The canals controlled by the dominion government afford access to navigation from the Atlantic to about 1,890 mi. of waterways. More traffic passes up and down the Detroit river than over any other waterway; the traffic through the Welland canal and the locks at Sault Ste. Marie, linking Lake Huron with Lake Superior, Ont., in 1944 exceeded 128,000,000 tons, of which a little more than 112,000,000 tons used only the U.S. locks at Sault Ste. Marie. In 1943, 23,472 vessels passed through the canals of the dominion, carrying about 21,500,000 tons of freight, chiefly grain, petroleum products, iron ore and coal. Of the total waterway mileage under the control of the dominion government in 1946, 509 mi. were constructed canals.

The St. Lawrence waterway project had been under discussion for more than a generation. Canal navigation between Montreal and Prescott was limited to vessels of about 270 ft. length and 14 ft. draught. Under the St. Lawrence seaway agreement made in March 1941 between the U.S.A. and Canada, it was proposed to build an international ocean waterway at a cost then estimated at \$350,000,000, of which Ontario would contribute \$89,250,-000, the dominion government \$45,250,000 and the U.S.A. the remainder. New construction work could not begin on any large scale until the U.S. senate had passed the treaty, which had been under consideration for several years. Meanwhile, the Beauharnois power and navigation canal along the right bank of the St. Lawrence river, which was ultimately to form a link in the ocean waterway, was already in existence. The minimum depth of water in the channels of the waterway was proposed to be 27 ft. and the project included a further deepening of the Welland ship canal to 30 ft. With this great project realized, large ocean-going ships would be able to reach any of the Great Lakes by way of the St. Lawrence river.

Europe.—The development of inland water transport in Europe during 1937-46 was most marked in Germany and soviet Russia, though in Germany progress was slow before the Hitler regime and in soviet Russia canal construction did not begin on a large scale until the inception of the five-year plans. Canal construction and the improvement of existing waterways was also vigorously pursued in the Netherlands and Belgium up to 1940.

Soon after World War I, the League of Nations formed a transit section which for a time fostered and negotiated

agreements for the control and improvement of international waterways in Europe. A convention, concluded at Barcelona on April 20, 1921, on the Regime of Navigable Waterways of International Concern, laid down the principle of freedom of navigation and equality of treatment for all flags. In the years immediately preceding World War II, Hitler had denounced a large part of the agreements and conventions to which Germany had previously adhered. These conventions, including the Barcelona statute, became of little more than historical interest.

The increasing use of water power for the production of electric energy throughout the 20th century made it practicable to carry out many useful schemes of river canalization in European countries which would have been uneconomic but for combining hydroelectric power installations with dams necessary for making the waterways navigable. Such combinations of purpose might permit the economic development of many rivers in countries, e.g., India and the east generally, where major improvements for navigation had hitherto been impracticable.

The Rhine.-In 1926 Switzerland had completed the construction of a large river port at Basle in anticipation of the improvement of the Rhine between the Swiss frontier and Strasbourg. Navigation of the upper reaches above Strasbourg was complicated by a clause of the Versailles treaty by which France was authorized to build a lateral canal alongside the Rhine between the Swiss frontier and Strasbourg and to draw water from this river for the production of electric power. The river remained navigable in its upper reaches during the summer season only by barges of small draught. Three methods of improving the navigation were possible: (a) regulation and deepening of the river; (b) canalization; and (c) construction of a lateral canal. Swiss and German opinion favoured one or other of the first two solutions; the French pressed strongly for the last. In 1925 the control commission of the Rhine approved both river improvement by Germany and Switzerland and the construction by France of a lateral canal which was to be as free to navigation as the river itself. The first section only of the lateral canal was completed (1932): this was the most important from the point of view of navigation as it avoided the rocky bar of the Istein rapids below Basle and the locks accommodated barges of 1,200 tons capacity. The extension of the canal below Kembs was not carried out. In the meantime, Germany and Switzerland began improving the river itself to make it navigable throughout the year by barges of 1,200 to 1,500 tons capacity between Strasbourg and Basle, the objective being a minimum channel depth of 6 ft. 6 in. at lowest water level. This work, planned to be completed in 1941, was still unfinished in 1946. The Kembs barrage and locks suffered severe damage during the battle of Alsace in the winter of 1944-45. Repairs of the barrage and canal by the French were expected to be completed by the end of 1946. Repair of extensive war damage and removal of ruined structures still partly obstructing navigation were carried out in 1946 by German labour under the direction of the Allied control commissions.

The Danube.—In the riparian states of the Danube, the movement of industrial products downstream and of cereals and oil upstream produced a large increase in the river traffic in the years immediately preceding World War II. The European commission of the Danube, established by the Treaty of Paris in 1856, and the international commission set up in 1920 were still in being in 1946. The

former was concerned with the international largely technical control of the lower Danube from Braila to the Black sea. The system of international control by the commission was modified in 1938 by agreement among Great Britain, France and Rumania, effective control of the lower section of the waterway being transferred to Rumania. In 1939 Italy adhered to the modification and Germany was admitted to participation. The international commission did much good work in regulating the flow of the Danube, creating and improving navigable channels between Ulm and Braila and controlling the main river, between these points, and its tributaries. Under the two commissions, Danube navigation steadily expanded and grew more efficient, though traffic on the river never equalled that on the Rhine. War in 1939 suspended the work of both commissions, and in 1940 the river was the cause of acute controversy between Germany and soviet Russia which continued until Hitler's attack on soviet Russia in 1941.

Germany.—The total length of German inland waterways (1946) was about 8,100 mi. of which 4,660 mi., including 1,550 mi. of canals, were of first importance. The two main sections of the German waterway system (a) west—the Rhine and its supplementary canals and (b) east—the Elbe, Oder and their connections were linked by the completion of the Mittelland canal in 1938.

The project of enlarging the waterway made (1836-48) by King Ludwig of Bavaria for 120-ton barges, linking Bamberg on the Main with Kelheim on the Danube, was approved by the German government in 1922, but little progress was made until 1933. Following the occupation of Austria in 1938, the work was speeded up both on the canal section proper and on the canalized river Main; but in 1939 the project was still some years distant from completion, and small barges only could navigate the summit section. The enlarged waterway should have been opened to through traffic in 1945, but was still unfinished in 1946, though 1,500-ton barges could proceed up the Main as far as Wuerzburg. The length of the improved waterway from Aschaffenburg on the Main to Passau on the Danube was 380 mi. Canalization of the river Main and improvement works on the Danube below Kelheim had been substantially completed. The Danube below Regensburg was regulated by a dam with navigation locks constructed at the Kachlet rapids above Passau. The enlarged waterway had a potential traffic capacity exceeding that of any other river or canal system in Europe. Hydroelectric power installations were built in conjunction with many of the river dams, particularly those on the Main.

From the year 1935 onward, the German government made strenuous efforts to hasten construction. As a result, by 1940 a large part of the new canal and river works was in effective operation. The Mittelland canal, between the rivers Weser and Elbe, begun about 1890, was completed in 1938 by the construction of the last link of a waterway for 1,000-ton barges extending from the Rhine to the Oder.

River canalization works in progress in Germany from 1937 until their virtual cessation in 1944 included improvement of the upper Weser for 1,000-ton barges, begun in 1935, and of the middle Weser, begun in 1938; of the Neckar, for 1,200-ton barge traffic, originally planned to be completed up to Stuttgart by 1944; and of the Werra between Muenden and Wartha. The enlargement of the Dortmund-Ems canal from 700 tons to 1,500 tons barge capacity, begun about 1935, was so far advanced in 1940 as to make the southern section available to 1,000-ton

barges to and from the Mittelland canal; the northern section was expected to be completed by 1944. Vital sec tions of this waterway were heavily and repeatedly dam aged by Allied air attack during World War II; in 1946 repairs were not yet completed. The Masurian canal in east Prussia, begun before 1937, was by 1940 open to 400ton barges. In 1940, communication between the Odei and Upper Silesia was improved by the completion of the Adolf Hitler canal for 750-ton barges. Construction of a new canal to be known as the Oder-Danube canal started in 1939, but little progress had been made when the war ended. The deepening of the Ems-Weser canal to take 1,000-ton barges; the construction of the Elbe-Havel canal, also of 1,000-tons capacity; the low-water regulation of the Elbe and the improvement of the Oder navigation below the canalized sections up to standards required for 1,000-ton barges were completed or neared completion during the earlier years of World War II.

Water traffic in Germany mostly carried on the large navigable rivers and canals reached nearly 65,000,000 tons in 1910; by 1937, this total had risen to 133,000,000 tons For 1943, it was estimated at 180,000,000 tons, despite the cessation of overseas traffic to and from Belgian and Dutch ports and the reduced activity of German Baltic ports.

Czechoslovakia.—The canalization of the upper and middle Elbe (the Labe) and its tributary the Vltava was nearing completion in 1939. By late 1946 canalization had reached the town of Kolin and plans for further work had been completed.

Belgium.—The Albert canal, 70 mi. long, connecting the Belgian Meuse near Liége with Antwerp, was opened to through traffic of 2,000-ton barges in 1939 on the eve of the German invasion of the Low Countries: its cost was \$165,000,000. One important objective in the building of the canal, to provide a military barrier to invasion through the Netherlands, was defeated in dramatic fashion when invasion came. The Belgian government concurrently with the making of the Albert canal rebuilt the canalization works on the Meuse for 2,000-ton barges and extended them downstream, below Liége.

Netherlands.—Within a year of the end of World War II the ship canal from Ijmuiden on the North sea to Amsterdam was clear of obstructions and restored to navigation. The removal of war obstructions in the Rhine and Meuse and repair works on a considerable scale also made Amsterdam accessible by water from the Ruhr downward in 1945. Barges of up to 4,000 tons could then pass through the canal between the Rhine and Amsterdam.

In the interwar years, the Netherlands began and completed about 1935 the enlargement of many important canals and waterways and the construction of several new canals. Most of the works undertaken provided for the navigation of barges and other vessels of up to 2,000-tons deadweight capacity.

In 1932, the Netherlands and Belgium agreed to revise the 1839 treaty to the extent of permitting the feeding of the new Dutch Juliana canal from the waters of the Meuse in return for concessions made to Belgium which would enable other canals to be built in that country. The old dispute about the use of the Meuse waters was, however, not finally settled until 1937, when the Hague Permanent Court of International Justice held that each country was free to modify or enlarge a waterway situated entirely in its own territory, provided that the diversion



of water at the feeder and the volume to be discharged through the canal were not affected.

France.-In France, whose total length of navigable waterways in 1946 was a little over 7,000 mi., and where the capacity of barges in use on most of the canal system did not exceed 300-350 tons, little was done to increase the capacity of the waterways to take the large barges common in Germany and the Low Countries. One of the latest river canalization works carried out in France, on the Moselle from Metz to Thionville, provided only for barges of a maximum capacity of 350 tons. The project of the French government to make the Rhone navigable between Lyons and the Lake of Geneva made little progress except for the beginning in 1937 of the construction of the great Génissiat dam and navigation locks, still uncompleted in 1946. The project of improving the Rhone navigation below Lyons provided for a minimum navigation depth of 5 ft. 3 in.

U.S.S.R.-A vast program of expansion of inland navigation, the construction of new waterways and the improvement of others constituted important parts of the three five-year plans of the U.S.S.R. A large part of the projected works had been completed when Germany invaded soviet Russia in 1941. Information on the condition of these waterways and on the works completed or initiated after 1940 was scanty, but among the works in progress or completed between 1937 and 1941 were the following: the Moscow-Volga canal (80 mi.) begun in 1932 and opened to navigation in 1937: 190,000 workers were said to have been employed in making it; the Volga-Don canal (60 mi.) begun in 1938, to link the lower Volga with the Don, was to form one section of the Black sea-Moscow navigation; the Marinski canal system, a link in the waterway connecting Leningrad with Moscow, included the Moskva river navigation and was planned for completion in 1940; the Volga-Caspian canal, begun in 1939 to connect the navigable reaches of the river above Astrakhan with the Caspian sea; the Dnieper-Niemen waterway (315 mi.), with 30 locks, begun in 1939 to link up the river Yasiolda, a tributary of the Pripet, with the river Shara, a tributary of the Niemen (this waterway would form one link in the projected Baltic-Black sea navigation); the Dnieper-Bug canal (126 mi.) between the Dnieper and the western Bug, opened in 1940, provided an outlet to the Black sea for the products of western Byelorussia.

The improvement of the river Dnieper for navigation along its whole course begun in 1931 was still in progress in 1941. The new river port of Leningrad on the Neva, undertaken as a part of the third five-year plan, was nearing completion when Germany attacked soviet Russia in 1941.

Most of the canals newly constructed or enlarged after the inception of the five-year plans were designed for the transit of barges and other craft of 1,000 tons deadweight capacity or more. In 1946 the precise situation was uncertain, but the completion of the works included in the second plan would have increased the total length of the Russian navigable inland waterway system from 84,000 mi. to 101,000 mi. Passenger traffic on Russian rivers and canals remained important: in 1940 more than 70,000,000 passengers were carried by the river fleet. (See also Aqueducts.)

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Canal Zone

See PANAMA CANAL AND CANAL ZONE.

Canary Islands

See SPAIN.

Cancer

The ten years 1937–46 witnessed a great increase in both the experimental and clinical investigation of cancer as one of the great problems of medicine still awaiting solution. Cancer thus far had resisted all attempts at a specific cure. Much was gained by education in the signs and symptoms of the disease especially directed toward the lay public. Diagnosis improved greatly during the decade, and the methods of treatment advanced rapidly, but a real control over the disease was lacking. A large proportion of those developing an internal cancer still died of the disease. Yet real progress was made; research enlisted the abilities of many experts in chemistry, biology and physics, and the financial needs of such investigation were being generously supported by public and governmental agencies.

Causation.—Scientific investigators of cancer agreed that this disease of man and animals is an alteration in the normal cells of the body. The view at the end of the decade was that the changes in the normal cells which occur before a cancer appears may affect only a single cell or a small number of cells and is of the nature of a mutation; that is, a permanent change in the structure and chemical nature of the cell. The alteration from the normal may be slight and the cancer cell once produced may carry on active secretory functions; thyroid cancer making thyroid gland hormone and liver cancer, for example, secreting bile. Once the mutation has occurred it is irreversible; that is, cancer cells do not change back spontaneously into normal cells, but continue a life of their own, which in animal cancers had been proved by inoculation to be permanent. Many animal tumours had been inoculated for 20 or 30 years through thousands of generations, the cells retaining all the qualities of the original cell from which the cancer sprang. In animals of a purebred strain it became quite possible to transfer cancer cells by grafting and have them grow freely in all the animals of the same species inoculated, but there are many which will grow only in the animal in which they have arisen, and others which can be transplanted only with the greatest difficulty into the same strain. The reason for the change of a normal cell into a malignant cell was not clear at the end of the decade. It occurs under various conditions capable of being studied by animal inoculation. By 1946 the most fertile producers of cancer had been a group of chemical compounds of complex type related to the alkaloids in their structure. In many cases they belonged to the great class termed the phenanthrene group (see monograph by L. F. Fieser, The Chemistry of the Products Related to Phenanthrene, 1936). These were the most potent agents and had been known to be active in man in crude form after tar cancer was described by Sir Percivall Pott in 1745. Some members of this group have very high carcinogenic properties and can produce tumours very rapidly in almost all

species of animals. In general, the time of appearance is correlated with the length of the normal life of the animal; that is, in mice most tumours develop very quickly, and with the same stimulus it takes a little longer for a rat tumour to appear. Only occasionally had tumours been produced in the larger animals, such as dogs, long after inoculation had taken place. The fact that the tumour cells are specific for the animal species in which the cancer arises and cannot be grafted into the subcutaneous tissues of animals of another species proved that cancer is not a communicable disease. J. B. Murphy, H. S. N. Greene and others had shown that cancer tissues could be transplanted into the membranes of the chick embryo, the eyes of guinea pigs or rabbits, the brain substance, etc., and grow for a time protected more or less from the destructive effects of the fluids of the body. But, under normal circumstances, it was impossible to graft a mouse tumour into the subcutaneous tissues of a rat and obtain a permanent growth, or a rat tumour into a guinea pig; in other words, there is a cellular specificity which is characteristic not only of the cancer cell but also of the normal cell. For this reason, for example, skin grafting on man is only practical with skin from the individual upon whom the graft is to grow; that from another person is very apt not to take. The only condition under which cells can be transferred from one person to another is in blood transfusion, but even here careful studies of the groups of blood types must be carried out or a fatal result may occur. Also the transfused cells remain alive only for a short time. Tissues of low vitality and with very little circulation, such as the cornea, can be grafted, but this is related to the anterior chamber and the vitreous graft of tissues from one animal growing in another, as just mentioned. Apparently, then, the alteration in the cell, or mutation, is a permanent change and nothing alters it.

The Cancer Cell.—A popular belief, continuing through the decade, was that a cancer cell is a very active poisonous cell just like the bacteria which cause various epidemic diseases. On the contrary, a cancer cell is a very fragile cell and is easily destroyed if it can be reached with sufficient radiation from X-ray or radium. Unfortunately this is not very often possible because cancer cells are widely distributed at a very early period in the beginning of the disease. This is why it is not possible to cure all cases of cancer by radiation.

There is no question, at least insofar as the human body is concerned, that a considerable number of cancer cells which have entered the circulation die because they cannot obtain nutrition unless conveniently furnished with sufficient blood supply. It had been long pointed out that in the neighbourhood of cancer tissues blood vessels could be found which contained dead cells. If it were not for this fact every cancer would be rapidly fatal. The cancers of the blood (leucaemias) furnish an example of a disease which is incurable because of the universal transfer of the cells throughout the circulation and their growth in practically all the tissues. Persons with such cancers can often be improved and may live a considerable time, even years with suitable treatment, but reported cases of cures are so rare that it raises a question as to the diagnosis.

Despite the fact that the cancer cell is a very sensitive one there are great differences among cells arising from different organs. Some are much more resistant to radiation than others. If an attempt is made to destroy resistant cancer cells in an organ, the final result is that the organ is destroyed at the same time that the cancer cell is destroyed, so that a cancer in which the cancer cells involve an important organ cannot be cured because a dose to kill

the cancer cell will destroy the organ. Small, slow-growing, superficial cancers do not spread rapidly throughout the body and frequently can be permanently cured by surgical removal or destruction by an electric spark or by the rays of X-ray or radium.

With the discovery of the phenanthrene group of carcinogenic substances it was obvious to suppose that cancers occurring in the human body might be caused by some similar substance produced in the body by chemical changes or introduced by food. One of the first investigations in 1935 was followed by apparent success. A Russian investigator, L. M. Shabad, extracted liver tissue from patients with cancer of the stomach, reasoning that any chemical product would pass to the liver and perhaps be held there. Benzol was used for extraction and after the evaporation of the solvent the fatty residue, dissolved in olive oil and lard, was injected subcutaneously into mice. A certain number developed malignant tumours. However, repetition of the experiment with normal livers and with tissues like the lung in persons who did not have cancer showed that a slightly carcinogenic material could be obtained in the benzol extract. It was found that with other solvents extracts of various organs from normal animals will give rise to a few cancers in mice and even lard may do so. Shabad suggested that possibly the extraction process or some contaminant in the solvent might be responsible, so this work had to all be controlled by using albino rats or other animals as a test object before it could be finally accepted. These animals are much less apt to develop spontaneous tumours than mice. In other words, what originally promised to offer an explanation failed, as the experiments showed plainly that there was no specific carcinogenic substance in the body.

It was not necessary, however, to assume that cancer in the human body is produced by a carcinogenic substance. A. J. Earle at the Laboratory of Public Health Service at Bethesda, Md., was not only able to watch the transformation of normal cells into malignant cells in tissue culture when the fluid in which these cells were growing was contaminated with a minute quantity of one of the carcinogenic chemicals, but stranger still, some cultures which had no contact with any carcinogenic agent apparently became malignant. If this extraordinarily interesting experiment were to be confirmed, it would wipe out the necessity of assuming any specific agent acts to produce human cancer. This means, in other words, that anything which causes an excessive and non-functional proliferation of cells may ultimately permit a change to take place in these growing cells which results in cancer. An interesting clinical illustration of this fact is seen in superficial burns produced either by hot water or by contact with hot metals. The scar of the burn may be in a perfectly healthy condition for many years until the skin is broken, and then because of the poor nutrition of such damaged tissue, a small ulcerated area remains. If not given prompt medical attention in the course of a year or so a cancer may develop in such a situation. It was not the burn which produced the cancer; the burn only produced a local condition in which healing would not take place. This gave the tissues a chance to attempt to repair the injury. In that attempted repair many millions of cells divided; one of these cells in the course of this division may, again for some unknown reason, possess the capacity of growing freely throughout the tissues of the body. This one cell, therefore, is the beginning of a cancer. This, in a rough sense, is a repetition of the old idea of the origin of cancer from irritation,

because cancers are frequently seen to develop in unhealed areas on the skin. They develop in ulcers of the stomach; they develop in polyps of the intestine which are irritated by the passage of faeces; they develop in the mouth under the irritating effects from the prolonged and excessive use of tobacco. The more careful the study of the antecedent situation, the more likely it is that such a continuity of events will be discovered.

In 1946 there was still a school holding that viruses are the cause of cancer. There was no question that, as Peyton Rous had originally shown, there is found in chickens a type of tumour which is transmissible by a filtrate which is cell-free. There are also some benign human tumours, like the contagious warts, which are known to be caused by a germ so small that it passes through a filter fine enough to hold back all cells.

In an interesting discovery, J. J. Bittner found that young mice from a strain which rarely or never developed cancer, when allowed to nurse from mothers of a high breast cancer strain, also were apt to develop breast cancer when they grew up. This extraordinary phenomenon naturally led to a large amount of experimental study of the situation. Bittner finally came to the conclusion that it was caused by the fact that breast cancer in mice, at least in some of the high-frequency strains, is the result of a virus and that in nursing the virus is transferred to members of the non-cancer strain, who then develop cancer. There was no dispute concerning the facts as observed, but final agreement on the nature of the transferring agent had not yet been reached. It was difficult to perform the parallel experiment in rats, and no one with even a minimum of scientific judgment would generalize from a single species of animals. Despite this lack of evidence that the phenomenon was in any way general, several papers appeared advising women in a family in which cancer of the breast had occurred to avoid nursing their female children. Such a recommendation was utterly without basis and added one more source of nervousness concerning cancer. S. Peller criticized this transfer from mouse to man from a statistical point of view, stating that apart from the milk factor in mice others were present which complicated the situation and rendered it doubtful that, in mice at least, any one agent could be incriminated. Peller enumerated heredity, age, hormonal activity, dietary and caloric factors which either promote or retard or even prevent the appearance of breast cancer in animals. He stated that cancer of the breast in the human female plays a minor part in the disease, only about 4% or 5% of women developing a primary cancer in that organ. About 15% die from cancer of some other organ, and some 78% to 80% never have cancer, so that apparently in women the milk factor, even if it should exist, is not as important as it seems in mice. Peller said that if there was any truth in the proposal made by L. Gross it would lead to the abolition of breast feeding. However, as breast feeding by 1946 was very much less frequent than it was a few years before, there was little likelihood that this milk factor in breast cancer was of any importance in the induction of cancer of the breast in human beings, especially as there was not the slightest evidence that a virus causes human cancer.

Another very interesting investigation was conducted by Peyton Rous and W. E. Smith. Ever since cancer had been studied microscopically it had been noticed that tumours of extreme complexity occasionally occur in the body of human beings, very often suggestive of structures seen in the embryo. Julius Cohnheim especially, among the older

pathologists, suggested that these tumours arose from cells of embryonal character lying latent in the organisms until some intercurrent factor released their inherent capabilities. Obviously the answer to this proposal was the injection of embryonic tissue into homologous animals. Occasionally some of this injected embryonic tissue grew for a short time, especially the cartilaginous fractions, but epithelium, usually after a short time of proliferation, quieted down to form an epidermal cyst. This had been so regular an occurrence that C. Oberling in his book *The Riddle of Cancer* dogmatically stated that there had never been a tumour of complex embryonic type produced by the injection of embryonic cells.

Peyton Rous felt, however, that possibly the embryo tissue needed some stimulus. When he implanted skin or bits of minced embryos and added a small quantity of carcinogenic chemical he obtained a variety of transplantable tumours containing a number of types of cells. Neoplasms developed rapidly, for example, after pieces of embryo stomach were grafted into a mouse. Many of these embryomata were transplantable and some metastasized. Sarcomas were less frequent than carcinomas. Rous believed that the rarity of malignant tumours at birth resulted from circumstances of intra-uterine life and to its brevity and not to any lack of capacity of the cells of the embryo to undergo neoplastic change.

H. S. N. Greene confirmed Rous's work. He transplanted a variety of embryo tissues and organs, including lung, stomach, intestine, muscle and cartilage. About 60% of the transplants fulfilled both morphological and biological requirements. Greene added that "embryonic tissues undergo such modification within 35 days whereas from 90 to 200 or more days are required before comparable changes appear in adult tissues" (Science, 101:644-645, June 22, 1945). A number of sarcomas were found, but Greene pointed out the sarcomas may arise under the conditions of the experiment from the connective tissue of the adult host rather than from the inoculated embryonic connective tissue. Greene also found that it was possible to transfer embryos either in whole or in part to the anterior chamber of the eyes or the testicles of rabbits or guinca pigs. The growths resembled teratomas and could be transferred serially into other animals. Similar results were obtained with human embryonic material transplanted to the eyes of rabbits and guinea pigs. It was impossible to transfer liver or the organs of internal secretion by this technique.

Tissue Specificity.—The discovery of a large number of carcinogenic chemicals led to some very interesting results in tissue specificity. For instance, methylcholanthrene and the immediate closely related group of phenanthrene compounds apparently are capable of producing tumours in all of the mammalia, at least in those available for laboratory experimental purposes. Alpha-naphthylamine, on the other hand, does not produce cancer when fed to animals, except in the bladder, and has no carcinogenic effect when injected subcutaneously. P-dimethyl-amino-azobenzene and 2-amino-5-azo toluene do not cause tumours when injected under the skin, but when they are fed to white rats, which are kept on a diet low in vitamins, they cause a cirrhosis. In the cirrhotic liver cancer develops. The cirrhosis and the cancer do not appear if the diet is a normal one. The eggs of Taenia crassicollis, a tapeworm parasitic in the cat, form cysts in the liver when fed to rats, and in the cyst wall some 17 different types of sarcoma had been found by 1946. The liver is an epithelial organ, but despite this fact out of thousands of sarcomata, only one carcinoma was found. On the other hand, an osteogenic sarcoma containing cartilage and bone was once discovered in the walls of one of the cysts of the liver after feeding tapeworm eggs.

Mixed Tumours.—For many years complicated tumours were all seen in man, chiefly in the salivary glands but also elsewhere; they were the subject of much theoretical discussion without any final solution of the problem. It was generally assumed by histologists that epithelial and connective tissue remain as independent types during adult life and that it is only during embryonic development that the distinction between the two is not always possible. A good many pathologists, including James Ewing, Pierre Masson, etc., had assumed, on the basis of morphological study of a variety of mixed tumours, that it is possible for epithelium to form a mesodermal type of tissue such as cartilage. W. F. Dunning, M. R. Curtis and M. E. Maun attempted an experimental solution of the problem with their large material of purebred strains of rats. Twentyseven malignant mixed fibro-epithelial tumours were available for this study.

Transplantations of the tumours were followed in some instances by separation of the two components. Metastases from these tumours either carried both components, epithelial and connective tissue, or they might result in a pure culture of one component of the original growth. In one case the carcinomatous portion of the tumour was carried by grafting for nine successive generations without showing any stimulating action on the fibroblasts of the new hosts. It is obvious that the original tumour was composed of malignant epithelial and connective tissue and that these elements were separable and both autonomous. It would seem that this demonstration of the possibility of segregation of two fractions of a complex tumour cast much more light upon the nature of these growths in the salivary and lacrimal glands than did years of argument.

Human beings from the time of the Pharaohs have suffered from a parasitic worm (Bilharzia) which enters the skin of the lower extremities and discharges eggs which enter the urinary bladder and set up an irritating inflammation in that organ, often followed by cancer. In Caribbean populations the eggs of a similar parasite do not irritate the bladder, but instead enter the mucous membrane of the rectum and cause carcinoma of the rectum. A slight difference in the parasite induces a cancer in a different site. Feeding urethane to mice greatly increases the incidence of cancer of the lung. There is, then, a certain amount of organ specificity in cancer-producing irritants. When it was remembered, however, that the U.S. public health service had published a volume listing more than 600 carcinogenic substances causing cancer in animals and in man, it became obvious that there can be no single cause of cancer, and that the only cause is the proliferation of tissues caused by some irritant substance, some disorganization of internal secretion and some hereditary malformation which favours slow reparative processes. During this multiplication of cells a mutation takes place and the cancer cell is formed.

Cancer in Man.—Knowledge of the differences in the occurrence of cancer in different organs and races had become full as regarded experimental animals, but it was still very difficult to get comparable properly controlled human material. A large number of very interesting observations were made, however. C. Bonne in Java, for instance, made statistical studies on large groups of indentured workers upon whom postmortem examinations are always made. He found that the greater proportion of the Chinese had cancer of the stomach, whereas the Malays, working under the same conditions, had cancer of the liver. The Malays also had a great excess, as compared

with the Caucasian races, of a very unusual type of tumour -a reticulum cell sarcoma which occurred as huge masses in the neck and was often rapidly fatal. The Negroes of Curação in the West Indies differed greatly from the white population in that they had an excessive amount of cancer of the upper digestive tract. It was found that 25% of all cancer deaths were caused by tumours of the oesophagus, a relatively rare condition in whites in temperate climates. The American Indian and the Eskimo had long been popularly supposed to have little or no cancer, but publications showed that they had the same amount as the white races. Such studies, while difficult to collect and analyze, were certain to cast some light on the causation of the disease and to be useful in diagnosis, the basis of all treatment. The publication of atlases, such as that of the French Cancer society; monographs, such as the one on bone sarcoma by A. Kolodny, for which the American Society for the Control of Cancer was responsible and the Atlas of Ovarian Tumors by G. Barzieai, were of great value in standardizing the microscopic diagnosis of tumours, thus forming a basis for judgment as to whether X-ray or surgery was the proper therapeutic agent and the results to be expected in the application of either.

Treatment: Surgical.—The strides made in the treatment of malignant diseases during the decade 1937-46 attracted much less popular attention in the daily press than the emotional articles on 200,000,000 electron volt betatron generators or radioactive phosphorus. Actually the treatment of cancer made very great advances, perhaps quite as much as in any other aspect of medicine. In the first place, the diagnosis of tumours had become very well standardized. By 1946, there were publications in considerable number giving the records of the results obtained by surgery on all of the important tumour groups. In this field the College of Surgeons had collected nearly 40,000 cured cases of cancer as forming a basis for estimating the capacities of surgery. Instead of reporting patients at the end of five years as cured, it was realized that ten years was a safer limit for a final computation, because a certain number of patients died after the five-year period had elapsed. Many of these were carried toward the ten-year limit by suitable X-ray treatment, the development of which was very marked.

Serum Diagnosis.—The fact that many internal cancers were not recognized until they were too advanced to cure led to an immense amount of energy spent in attempting to devise some chemodiagnostic method for cancer, just as the Wassermann reaction reveals the presence of syphilis, or the Aschheim-Zondek reaction the presence of a foetus or of a tumour composed of placental tissue. Despite every effort, a reliable test had not been devised by 1946, with the one exception noted. The chief difficulty was that all the tests gave a high percentage of false positives and thereby might lead either to unnecessary exploratory surgery or to cancer phobia. Few of the tests, even in the hands of the inventors, had given better than 75% of positive tests in well-developed cases of cancer. Certainly it would be extremely unwise to inform a patient of the possibility of a growth on so flimsy a basis, especially when the development of X-ray and other instrumental technique in diagnosis had been outstanding. The various methods of demonstrating lesions of the gall bladder and genitourinary tracts by the injection or excretion of drugs containing iodine or other opaque components had given very complete visualization of these regions, and certain optical improvements had made it possible to diagnose most of

the growths of the respiratory, lower intestinal and urinary tracts and to photograph for record purposes the lesions of the gastric mucosa.

Moreover, the great improvements in local and general anaesthesia, such as the intravenous use of pentothal sodium and similar products, permitted rapid exploratory operations for the removal of biopsy specimens or the exploration of accessible lesions with very little risk even to the seriously ill patient who could not stand a general anaesthetic. It became common experience to get biopsy material from the thorax, throat, bronchi, bladder, high-up rectal tumours and so on, which at the beginning of the decade were never obtainable. The mere demonstration of a carcinoma might not mean that the patient was necessarily to be cured, but at least he was going to be treated with intelligence and given every possible chance. No field was a better demonstration than that of surgery of the lung. While the number of people cured by excision of considerable lung tissue for a malignant growth remained small, nevertheless, all had died until the combination of the physiologist, the anaesthetist and the surgeon showed that the pleural cavity could be opened, the tumour resected, and-if the growth was sufficiently localized-the patient's life saved. The speed and effectiveness of modern surgery were certainly caused in part by the developments resulting from the handling of mass material during World War II.

The combination of physiological studies and surgery resulted in an extraordinarily interesting situation with regard to a very common type of cancer, that of the prostate. This was one of the most difficult fields in which to obtain cures, or even to afford a patient some relief. The prostate is situated in a complicated anatomical region so that extension of the growth to the pelvic bones takes place at a very early stage. C. Huggins found that the removal of the testicles in man caused an extraordinary relief from symptoms of the disease. In some instances individuals who were bedridden and taking large quantities of morphine without much benefit were able to resume their occupations. The phosphatase tests were useful in this connection as helping in the diagnosis and prognosis. It is probable that the removal of the gonads makes the bone metastases, which occur so early in carcinoma of the prostate, shrink somewhat and become slightly more sensitive to radiation, which is a great help because of the early involvement of the osseous structures in most of the patients. Morphological studies on the tumour removed after operation showed very considerable regression of the glandular structures-the explanation of the clinical improvements. Some patients received no benefit; many were made more comfortable for a time, and some became free of symptoms for several years or more. In judging the results it must be remembered that a certain number of cases of carcinoma of the prostate are found only after death from other causes, but there was no question that this was a forward step in the treatment of a very hopeless disease. There was no reason to expect, unfortunately, that any of the patients could be permanently cured. (The usage of properly high dosages of synthetic oestrogens by mouth in many cases apparently brought prostatic carcinoma under control.)

The great success in this field led to the administration of testosterone to women with carcinoma of the breast. Unfortunately there was not infrequently a slight slowing of the growth of the breast tumour under the influence of large doses of testosterone. This led to the treatment with

this drug of a certain number of patients with small tumours, the individual being delighted to escape surgery; but testosterone does not permanently inhibit the growth of a breast cancer, and by the time this fact is discovered the patient has lost her opportunity for surgical cure. There are also some very unpleasant concomitant effects produced by large doses of the drug which are extremely distressing both to the patient and her relatives. It is therefore always wiser to do a radical mastectomy as soon as a positive diagnosis can be made, and then if it is thought desirable, testosterone can be administered. Apparently this chemical reduces the sensitivity of the skin to X-ray, and larger doses of that agent can be given without producing severe skin irritation. It therefore may be of some slight value in the radiation treatment of post-operative recurrences.

Radiation Therapy.-Advances in radiation therapy during the decade 1937-46 were not so striking as in surgery. The principles underlying treatment had been laid down by Claude Regaud and his school 30 years before the end of the decade, but the treatment so outlined was tedious both to the patient and the operator; it was also expensive to the patient and destructive to apparatus, and only in later years received any widespread recognition. The studies of the Crocker laboratory, using biological materials, showed the basic fact that if back-scatter was eliminated, a roentgen unit of X-ray energy was just as effective in killing cells at 10,000 volts as it was at 1,000,000. The advantage of 1,000,000 volts was purely in one direction, and that was that the back-scatter against the skin from the impinging dose was only 3%. In other words, nearly all of the X-ray energy enters the body of the patient, whereas at 200,000 volts 35% is scattered back against the skin from the deeper tissues and thereby damages that tissue and limits the application of the radiation through the skin at a much earlier stage than at the higher voltage. In most instances it is possible to meet this difficulty by using multiple portals, but there are situations, such as arise in the treatment of carcinoma of the bladder and certain tumours of the nasopharynx, which need heavy doses and can better be handled by a voltage above 200,-000. The objection to the 1,000,000-volt machine is its initial cost, the expense of operation, the large amount of protection from scattered rays required for patients and personnel, and the fact that it is unnecessary except in special instances; in other words, such machines need an endowment. While radium gives off gamma rays at about 1,250,000 volts, the price was still too high in 1946 for use as a pack. Unless large quantities were available, proper geometric distribution of the radiation could not be obtained. Perhaps the cyclotron or the uranium pile would develop a radioactive element giving large quantities of gamma rays, with a half-life of 20 or 30 years and producible in quantity for a low price. In that case it would be an advantage to return to the use of radium packs, the advantage of which lay in the fact that, as Regaud showed in 1913, prolongation of the treatment is one of the important factors. Long external exposures with a pack can be made on bed patients which combine convenience and prolonged, slow treatment.

Long after Regaud, D. den Hoed and D. Levie showed by tests on animals that radiation given at a rate of 20 r. per minute caused much more permanent normal tissue damage than the same dose when given at 5 r. per minute and was less effective in curing the cancer. The atrophy of the skin was always more marked on the side of the rapid radiation; hyperkeratosis was rare at the lower rate; necrosis caused by endarteritis was less in the slow rate

areas, and the experiments definitely showed that less permanent injury is inflicted on the tissues by radiating at 5 r. per minute than at 20 r. Most carcinomata required 8,000 roentgen units for their destruction. That amount was within reach of external radiation therapy. It was often more convenient to obtain this amount by the use of radium emanation seeds which could be left in situ or by combination of X-ray and removable radium needles. Some tumours, like carcinomas of the mucous membranes of the gastrointestinal tract, required more.

Cancers of this region therefore were out of reach of radiation therapy. Palliation could be accomplished but cure could not be expected. Eight thousand r. meant 40 treatments of 200 r. which takes 40 minutes at 5 r. per minute. Many patients would not persist in such a treatment. They said that X-ray caused cancer, but vast numbers of patients had been radiated with X-ray and radium and had never had cancer develop afterward. Overdosage with destruction of the tissues was the basis for the cancer, and rapid administration was one of the reasons for serious injury to the skin.

Much was hoped for the radioactive elements produced by the cyclotron, but the employment of intravenous radioactive material had been shown to be dangerous by W. Falta and those with the most experience were, in 1946, beginning to abandon its use as uncontrollable and in many instances dangerous. The same was true of neutrons. The betatron was cited in the daily press as giving voltages of 200,000,000; this was not the voltage in the ordinary sense, however, but electron volts. As radium gives off electrons of almost the same velocity, there was no probability that such electron beams would be of practical value, for the early use of unscreened radium resulted in a series of destructive burns. Physicians had long since learned to filter off the beta rays from radium with a considerable thickness of heavy metal. Improvements then in the use of radiation were great, though their adoption had been slow. Many radiotherapists could point out patients who had survived diseases of the lymph node type, leukemias, even inoperable carcinomata, living for 10 or 15 years; patients with Hodgkin's disease restored to health for long periods of time, and patients with recurrent carcinoma of the breast cured for 10 or 15 years, bone tumours cured without operation, epitheliomata of the skin, lip, tongue, tonsil and so on cured apparently permanently. On the other hand, there were fields into which radiation could not enter. These included most of the brain tumours, cancer of the lung, of the gastrointestinal tract and prostate, and most of the bone sarcomata. All these still belonged to surgery, if surgery was possible. But the situation in 1946 was far from that of the days when patients had to be told that a small recurrence on the chest or a node in the neck was a death warrant. Many could now be assured of comfortable and useful life for many years by the intelligent use of radiation.

Curative Sera.—On the analogy of the specific antibodies obtained from bacteria, like diphtheria or tetanus antitoxin, pneumonia antiserum, etc., innumerable attempts were made to obtain similar protective or curative sera for cancer. While in general no antibody had been found which had a definite lethal effect on growing tumours, occasionally an observation was made which suggested that the long search might some day be rewarded. For example, J. G. Kidd reported that some rabbits may develop an inhibitive antibody in the blood after inoculation with cell-free saline extracts of the Brown-Pearce tumour which prevents the subsequent inoculation of the tumour. The protection, however, was not always complete and cures

were not obtained. Similar destructive action on growing tumours in mice was obtained by R. Lewisohn and coworkers using various toxic bacterial products. The effective intravenous dose was accompanied by so high a mortality in the treated animals that no tests on human beings were made. Apparently the action is allergic in nature, the tumours often being converted into haemorrhagic sacs because of damage to the smaller blood vessels which ultimately thrombose. Evidently surgery and radiation were the only effective curative agents at the end of the decade. (See also BIOCHEMISTRY; MEDICINE; RADIOLOGY; UROLOGY; X-RAY.)

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Candid Camera

See PHOTOGRAPHY.

Candy

Annual sales of confectionery in the United States nearly doubled in the ten year period from 1937 to 1946, when 1,482 manufacturers, employing 70,000 persons, produced 2,400,000,000 lb. of candy valued at approximately \$625,000,000. The industry reached an all-time high in 1944, when the volume was 2,804,000,000 lb., valued at \$658,000,000. In 1937, 1,200 manufacturers made 2,050,000,000 lb. with a wholesale value of \$321,000,000.

Table 1.—Estimated Confectionery Production, Per Capita Consumption, and Value of Sales, 1937–46

Year	Production (millions of pounds)	Per capita consumption (pounds)	sales value (millions of dollars)	Average value (cents per pound)
1937	2.010	15.5	321	16.0
			321	10.0
1938	1,955	15.0	298	15.2
1939	2.050	15.7	308	15.0
1940	2 225	1/0		
1940	2,225	16.9	336	15.1
1941	2.536	19.0	403	15.9
1942	2.519	18.7	490	19.5
1943	2,561	19.0	<i>5</i> 75	22.4
1944	2,804	20.5	658	23.5
1945	2,562	18.7	620	24.2
*1946	2.400	18.7	625	25.0
*Estimated.				_5.0

Elsewhere in the world, however, candy manufacturers did not fare as well. In fact, from 1939 to 1945 very little candy was made in any country outside the United States, Great Britain, Latin America and Germany. At the same time, candy produced in the United States and Great Britain during the years of World War II was used to a considerable extent (some 20%) in the war effort. By the same token, candy and chocolate also proved "instruments of war" for the Germans. In each case, science and research were given full play, and as a result, wartime developments enhanced the importance of candy in nutrition during peacetime. In the United States, candy manufacturers produced various types of rations, including ten-in-one, K, C, D, air crew lunch, life boat and parachute. Developed through research by means of joint government-industry co-operation, these rations came in forms of bars, solid chocolate, fudge, caramels, jelly drops, hard candy and sugar-coated peanuts. They came in specially prescribed sizes and were packed in prescribed packaging and packings to withstand various temperatures, climates and shipping conditions. Fortification, by means of added vitamins and minerals, played a major role in the production of candy and candy rations for the armed forces of the United States and Great Britain.

In addition to using candy and candy rations as sources of food and energy for its armed might, Germany provided its forces with candies that contained large quantities of caffeine and other drugs to keep them awake and alert during difficult combat sieges. Unlike the United States, Germany permitted the use of saccharin and other nonfood substitutes in confectionery. In the United States, the use of such nonfood sweetening agents in candy (and other foods) was specifically prohibited under the Federal Food and Drug act, as well as under all state food laws.

The United States remained by far the most important candy centre in the world. Compared with the 1,482 candy manufacturers and plants in the U.S. at the end of the decade 1937–46, there were 1,739 plants throughout the rest of the world, divided by nations as follows:

Argentina	
Australia	
Bolivia	
Brazil	12
British Guiana	2
British Malaya	4
British West Indies	10
Canada	138
Chile	35
Colombia	99
Costa Rica	19
Cuba	112
Dominican Republic	18
Ecuador	19
Egypt	19
El Salvador	-
England	240
Guatemala	- 4
Haiti	11
Honduras	8
India	48
Jamaica	-(
Mexico	1 = 6
Newfoundland	٠,
New Zealand	ĕ
Nicaragua	1
Northern Ireland	
Palestine	Š
Panamá	9
Paraguay	Š
Peru	98
Puerto Rico	20
Scotland	90

Union of South Africa 3	6
Uruguay 3	, l
Venezuela 5	7
Wales 2	2

In addition to manufacturing the largest quantity of candy, the United States also produced a greater variety of confections than any other nation. For example, the United States made solid chocolates, hundreds of varieties of chocolate-covered candies, many types of bar goods, different classes of hard candy, jelly beans, pan work, nut products, seasonal goods, stuffed fruits, glacé candies, iced goods, pops and suckers, taffies, toffees, etc. Compared with this, other countries were noted for only a few varieties of candy. To illustrate, England continued to make mostly solid chocolate bars and toffees. (Incidentally, England made more coated goods than the United States, where the consumer had learned to like hard candy and uncoated soft goods almost as much as chocolate coated confections.)

In soviet Russia and the other Slavic countries, hard candy, including plastic and filled, remained the most popular. In the Netherlands, coffee and a combination of chocolate and coffee candies continued to rate very high in popularity. In Germany, solid chocolate bars led the field in consumer preference and production. In France, perfumed candies met with general consumer acceptance, but were practically unknown in the United States and other English-speaking countries.

During the decade, however, there was a notable change in consumer candy preferences throughout the world. Responsible for this trend were the U.S. troops stationed in the four corners of the earth. With more than 20% of the candy production of the United States shipped to troops in all parts of the world, American candy became very popular, with the result that manufacturers in various countries began to make, or plan to make, American types. Plans were also afoot by American manufacturers to export candies on a greater scale in the world market as soon as sugar shortages were eliminated and other production difficulties were overcome.

Candy also became a major item among the Latin-American countries, particularly in Cuba, Mexico and in the Argentine. Before World War II, there were fewer than six candy plants in Mexico. In 1946, there were more than 150. In Cuba there were about 100 plants operating in 1946, as compared with only a handful before the war. Most of the confections made in Latin America were of the hard candy type.

Inversely, the war years resulted in new trends in candy production in the U.S. markets. The decade saw the establishment of many plants in the United States by European refugees who brought with them the knowledge and craftsmanship they had used for generations in Europe, particularly in Austria and France. The candies introduced by this group of manufacturers, numbering more than 100, were known as "continental types"—moulded chocolates made in specially designed metal moulds. Because of the increase in importance of this type of candy in the United States, new machines were invented to simplify and speed its production.

Nonmelting and Nutritive Candies.—One of the most revolutionary developments in the candy field during the decade was the introduction of a type of candy that would withstand extreme temperatures, both in the tropics and the arctic climates. While the development of candies that would hold up well in cold climates was not a difficult problem, the perfection of a confection that would meet the standards required in the tropics presented a problem

of great complexity. However, it was solved, and the product used by the soldiers in the jungles of Africa and other tropical climates had a low melting point and could withstand temperatures as high as 120° F., and sometimes even higher.

Helping greatly in improving the keeping quality of candy rations during the war was the use of a product referred to as the 100-hour shortening. This was a hydrogenated vegetable oil able to stand exposure to active oxygen for 100 hours without showing deterioration or rancidity. Able to withstand heating to 400° F., without change in colour or flavour, a shortening of this type stood up under long storage periods.

The high melting point or nonmelting coating for bar goods was another product which gave improved keeping qualities to candies shipped abroad. By adding to the mechanical strength of the bar in keeping moisture and oxygen from penetrating the centres, coatings of this type withstood strenuous storage conditions and protected the centres of the bars. At least one manufacturer developed a real chocolate coating having nonmelting properties.

During the war, the Research and Development laboratory connected with the Chicago Quartermaster depot developed a process which resulted in a nonmelting type of chocolate bar able to withstand high temperatures. Because commercial chocolate bars had a very low melting point, this was no easy job.

The decade also saw candy receiving greater acceptance from the point of view of nutrition. The U.S. department of agriculture, with the aid of the National Confectioners' association, established a number of research and experimental stations for the purpose of developing candies that would have greater dietary values and, at the same time, consume larger amounts of agricultural products, particularly those types of plant and vegetable life that had not hitherto been used in the manufacture of candy.

The stations were located in Illinois, California, Alabama and Louisiana. As a result of these experiments, soybean products, pulverized wheat hearts, cottonseed flour, peanut flour, sunflower seed meal, fruit concentrates, yeast, pectin and other ingredients were added to creams, fudge, nougats, caramels, jellies and other types of candies, making for better balanced foods while retaining the taste-appeal which the U.S. expected of all candies.

Experiments to find possible new ingredients containing natural plant constituents—protein, fat, carbohydrate, minerals and vitamins—continued constantly in the effort to produce finer, more nutritious confections.

An interesting development, also a result of these developments, was the introduction of a starch sponge for potential commercial use in candy and other foods. This starch conversion product could be used for several purposes. In its dry state it had a crispness that imparted crunchiness to candies and crackerlike wafers. When shredded, the dry sponge could be used like shredded coconut or shredded nutmeats. Whether ground or shredded, it could be incorporated into chocolate candy coatings or candy bars to improve their texture and their ability to withstand extreme variations in temperature. Showing promise as a stabilizer in confectionery coatings and icings, the starch sponge could be used as a carrier for flavouring extracts and in chocolate, soya and wheat flours, vitamin preparations and fruit, vegetable or meat concentrates. Such ingredient materials were added to the starch paste before it was converted to the sponge state by freezing and drying.

By impregnating starch sponge with sweet chocolate, a new type of confection was made. This chocolate confection was crunchy, disintegrated rapidly in the mouth without becoming gummy and did not have the cloying sweetness of the chocolate alone. Compressed sponge is a concentrated carbohydrate and, as such, had obvious possibilities in emergency rations and sportsmen's packs.

For the first time in the history of the candy business, an evaluation was made of the nutritive value of candy ingredients. While candy had usually been classed as an energy food, research and changes in production formulas during the decade, plus the addition of new ingredients, increased the protein, fat and mineral content to an appreciable extent.

Chocolate, eggs, milk and nuts, all used in candy, are sources of essential body-building proteins. Nutrition authorities grouped nuts with peas and beans as economical protein foods to be used occasionally instead of meat, poultry or fish. The candy industry used about 250,000 tons of all kinds of nuts in a year.

The caloric content of candy was derived from many sources. The fat supplied by butter, chocolate, cream, eggs, oils and nuts contributed to its energy value. Fats are needed in the diet for certain essential fatty acids. They also act as carriers of some of the vitamins and are concerned with the utilization of carbohydrates.

Many candy ingredients also contained some or all four of the following minerals: calcium, phosphorus, iron and copper. Table II shows the relative nutritive values of eight candy ingredients, as compared with an average taken from ten candy items.

To produce 2,500,000,000 lb. of candy annually with an approximate wholesale value of \$625,000,000 and a retail value of \$1,200,000,000, the candy industry used ingredi-

ents at an approximate cost of \$300,000,000. Cane sugar was the largest single item in this group, accounting for about 800,000,000 lb. Corn syrup was the second most important item, with 700,000,000 lb. used annually.

The candy industry in the United States also used 230,000,000 lb. of chocolate, 6,000,000 lb. of eggs, 400,000,000 lb. of milk, 30,000,000 lb. of fats and oils and 10,000,000 lb, of fruits annually. (See also Cocoa.)

Table II.—Nutritive Value of Candy Ingredients
(Calculated for 100 Gram Portions)

	(Caice	Nated to	100 3	rum roi	nons)							
Ingredient		Minerals Vitamins										
A B_1 D G	Gm.	Gm.	Gm.	Gm.	Gm.	Pro- tein Mg.	Carbo- hydrates I.U.	Fat I.U.	Calcium I.U.	Phos- phorus Gamma	Cal- ories	
Peanuts (roasted)	26.9 11.0 25.8 6.0 0.6 0.0 0.0 12.8 9.2	23.6 15.1 38.0 54.0 0.4 80.6 99.5 0.7 59.5	44.2 69.7 26.7 33.5 81.0 0.0 0.0 11.5 25.3	.07 .09 .9 .02 .01 .07 .08	.40 .34 .7 .02 .01 0 .18 .18	2.3 2.6 1.7 0.2 1.5 0 3.0 2.5	2400 0 0 1000	90 350 120 × 0 0 50	0 0 16 x 80 0 0 50	350 300 1500 8 0 0 330	589 713 496 522 733 322 398 158 498	
x-Fair. I.U.—International Units	5.	Mg.	Milligr	am.								

Gamma used as the measurement for Vitamin G is the equivalent of a microgram.

Source: Cooper, Barber and Mitchell, Nutrition in Health and Disease. Eighth edition, 1941. Published and copyrighted by J. B. Lippincott Co., Philadelphia. Reprinted herewith by permission of the publishers.

^{*}Vitamin assay now being made. Figures not yet available.

Gm.—Grams (One hundred grams is equal to approximately 3½ ounces).

Chemical analysis of candy items made by the Miner Laboratories, Chicago, III.

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Cane Sugar

See SUGAR.

Canning Industry

In the period 1937-40, there was no noteworthy change in the overall United States canning production although steady increases in size of pack occurred in fruit juices, fruit and vegetable specialties and milk. Undoubtedly influenced by the war situation, abrupt increases occurred in 4941 in nearly all packs, resulting in a total of 468,100,000 cases as against 384,100,000 cases in 1940. From this point there was, with the exception of the pack of 1943, a persistent upward trend, with the peak in 1946. Fruit juices showed exceptional gains in this period, and gains for the milk pack were maintained. The fish packs were remarkably constant over the ten-year period.

U.S. and territorial canned food production during the ten-year period 1937–46, including canned vegetables, fruit, fish and milk, is given in the accompanying table in terms of million standard cases.

United States and Territorial Canned Food Packs, 1937–46* (Million standard cases)

										1946				
		1937	1939	1940	1941	1942	1943	1944	1945	(Est.)				
Fruits		-55.5	52.0	48.8	61.6	58.3	44,3	56.0	49.5-	75.0				
Fruit juices .		22.0	29.5	39.9-	- 36.9	47.4	55.4	67.9	77.2	87.5				
Vegetables.		147.5	121.4	148.2	186.5-	-218.7	202.3	205.7	194.7	240.0				
Fruit and ve	qе	_												
table speci	al-													
ties		58.0	67.4	70.5	82.5	46.3	46.2	65.6	84.0	92.5				
Milk		44.9	50.8	58.2	77.4	82.7	73.1	82.2	90.3	72.0				
Fish	•	19.0	19.1	18.5	23.2	17.9	16.7	18.3	18.1	18.0				
Total		346.9	340.2	384.1	468.1	471.3	438.0	495.7	513.8	585.0				
*Meat pac	*Meat packs not included because of inadequate statistics. Specialties other than													
fruits and veg						,				o. man				

In view of the widespread geographical distribution of armed forces of the U.S. and the food needs of Allied nations, attention centred not only upon the food packs of the U.S. but the production elsewhere. This was particularly true in regard to Australian production, which was depended upon for subsistence of U.S. troops in the South Pacific. Canadian production was of importance also in supplying substantially the requirements of the British armed forces. Canning in Great Britain proper was at a low ebb after 1939, but with the actual level of production unknown through lack of reliable statistics.

In Australia, prior to World War II, approximately 10,000,000 lb. (330,000 cases) of canned vegetables were produced by some half-dozen canneries. By 1944, the production had mounted to 113,000,000 lb. (4,000,000 cases) from

59 canneries. Carrots led the list of canned vegetables at 46,000,000 lb., with beans next at 12,000,000 lb.

Australian production of canned peaches, pears, apricots and pineapple during the 1938-45 period was as follows:

																	1	P	r	0	Ċ	lu	C	ti	0	n				
Year												(Λ	1	ii	l	i) [ı	s	t	aı	ı	l	ıγ	·d	С	as	e	s)
1938																						3	٠4							
1939																														
1940																		•	•	•		. 3	.0	•						
1941															•					•		3	. 1							
1942											•				•				•			3	.3							
1943																	٠					. 2	٠5							
1944																		•		•		2	4							
1945																			•	•		2.	.3							

As further index of the status of the canned food industry in Australia as compared with prewar years, usage of tinplate in 1946 was at the rate of 115,000 long tons per year as against 50,000–60,000 long tons prewar, with 92% used as food containers.

Canadian production of canned fruits and vegetables during the period 1937-44 was as follows:

	Fruits	egetables
	(Pack in millions of ca	ises)
1937	2.1	. 14.4
1938		.14.0
1939		.12.2
1940	4.7	. 15.2
1941	4.5	.20.9
1942	2.1	. 18.6
1943		.14.7
1944		.22.0

The 1945 packs were estimated to be somewhat lower than in 1944.

During the decade of the '30s, production of pineapple averaged about 14,000,000 cases annually. Of this amount, slightly less than 10,000,000 was U.S. production, chiefly in the Hawaiian Islands. British Malaya and Formosa accounted for three-quarters of the production in other countries, with most of the remainder from the Philippine Islands, Australia and Cuba. No information was available as to wartime production in Pacific areas except for the Hawaiian Islands.

Prior to World War II, considerable quantities of tomatoes and tomato paste were canned in Italy. No information was made available as to production during the war, but reports indicated no immediate exportable supplies following the end of the war.

Utilization by the Armed Forces.—To attain complete mobility and constancy of food supply during the wartime period, U.S. armed forces relied on canned foods to the largest extent possible. The basic, peacetime ration utilized many perishable foods. Because foods for wartime use had to withstand shipment and storage under the most adverse conditions for periods ranging from nine months to more than two years, the basic wartime rations were composed of nonperishables—canned meats and canned and dehydrated fruits and vegetables.

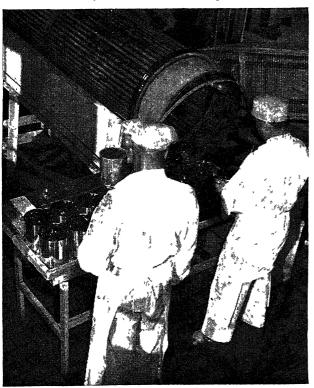
To ensure against bacterial spoilage which might occur during storage of canned foods at elevated temperatures, the U.S. army quartermaster corps equipped mobile laboratories for bacteriological surveys of the canning plants during the canning operations. Canned foods examined by the laboratories were certified for tropical use. Specially constructed, solid fibreboard and wood cases were used for protection during shipment. Joint investigation of lacquers, paints and waxes which could be applied after the canning operation was undertaken by can manufacturers

and the canning industry, and several of the coating materials proved efficacious in protecting the metal containers from corrosion. Protection of the cans in this manner was known as procoating; most of the canned foods for overseas use were procoated from early in 1943 to the end of the war.

Joint procurement and research facilities were established to utilize canning facilities to the fullest extent. While many canned food items, such as fruits and vegetables, were standardized and readily assimilated into the ration picture, it was necessary to develop many new items and adapt them to quantity production in the face of labour and equipment shortages. Canned meat products especially were limited in variety, and their number was increased from 9 to more than 50 during the war years. Through the complete co-operation of the canning industry it was possible to supply U.S. forces with an adequate, varied and nutritionally balanced diet.

Legislation.—Enactment of the (U.S.) Food, Drug and Cosmetic Act of 1938 was of particular interest to the canning industry, since the new law provided for adoption of minimum standards of quality for all foods analogous to those for canned foods under the old 1906 law. The latter had been amended at the request of the canning industry to make possible the promulgation of such minimum standards with the force of law. When a minimum standard of quality for any food had been adopted, any lots which failed to comply were required to be labelled to show that they were of substandard quality. Similar requirements applied to standards of fill-of-container. Such standards were sought for their value in regulating competition between that portion of the supply which was of highest acceptability and that which, although wholesome, was less desirable in respect to flavour, appearance, texture, uniformity, etc. Under the 1938 act standards of identity, quality or fill-of-container were adopted for all of the prin-

Food cannery at the federal penitentiary on McNeil Island, Wash., where prisoners helped to prepare canned goods needed for U. S. domestic consumption and lend-lease during World War II



cipal canned vegetables, the more important of the canned fruits, canned milk and some canned sea foods.

Research of the Industry.—In respect to quality of pack, and particularly to methods of ascertaining and designating quality factors, the industry exerted organized effort throughout the decade 1937–46. Instruments and tests for determining the suitability of raw materials were developed and gained wide use. One example of this was the tenderometer, a testing machine designed for determining the tenderness, and indirectly the maturity, of fresh peas for canning. Another instance was the test for percentage of alcohol in soluble solids, developed as a measure of maturity for canned peas and incorporated in the standard of quality for that product. Such tests found application in determining suitable forms of labelling to reflect quality attributes of canned foods.

There was a continued trend toward use of more informative types of labelling. This took two forms, the use of descriptive terms to indicate separate attributes, and employment of grade designations based on a weighted scoring system as a collective index of quality. Both systems had proponents, and in some instances both were used together.

Although considerable research on the nutritive values of canned foods had been accomplished prior to 1937, such work was given a fresh impetus by the results of research on the identity and evaluation of nutritional factors. The chemical nature of several of the vitamins had been disclosed, as well as the plural nature of some previously thought to be individuals. In addition, improved methods of assay were becoming available so that it was possible to express in numerical terms vitamin potencies which had previously been measured only in a qualitative or semiquantitative way. As a result, investigation of the nutritive qualities of all foods, including canned, was greatly facilitated. The largest single investigation of this sort was that launched in the U.S. in 1941, and continued in subsequent years, under the joint sponsorship of the canning and can manufacturing industries. Work under this project was divided among several prominent universities. The results received early application as a basis for design of rations for the armed forces, in addition to their function in determining the contribution of canned foods to the general dietary.

The Problem of Tin.—While the use of glass containers increased steadily, the canning industry continued to depend mainly on metal containers. As a result, canning was a large factor in the demand for tin. Of the U.S. consumption of tin, amounting to roughly 70,000 to 100,000 long tons during the years 1937-41, approximately half was accounted for by tinplate. With the advent of war in the Pacific in 1941, supplies of tin from the far east, which had been the principal source, were cut off by Japanese occupation. The greater part of the world tin supply had originated in the Malay states, Straits Settlements, the Netherlands East Indies and adjacent areas, the sources next in order of importance being Bolivia and the Belgian Congo. For the duration of World War II, no information was available as to the amount of tin mined in the areas under Japanese occupation, or the fate of the workings. It was later found that very little was produced in those areas and that mining equipment had deteriorated to such a point that several years would be required to restore production to a prewar level. Some alleviation of the shortage of tin resulted from increase in the production of Bolivian ore and construction of a new plant in

Texas for smelting and refining it.

Existing stocks and new supplies of tin were put under strict government allocation and a program of conservation was put into effect. In the U.S. and Canadian canning industries, this took several forms: (1) use of substitute containers utilizing less tin than theretofore; (2) reduction or elimination of the tin content of solders; (3) imposing quotas on production of some canned food items; and (4) prohibiting the canning of some foods, particularly those for which canning was not an essential means of preservation. The most far-reaching technological changes were those resulting from introduction of substitute containers, which were fabricated from types of plate previously produced in small volume or not at all. For some products, it was found possible to use hot-dipped tinplate of lower tin content than that used for many years, electrolytically-coated tinplate bearing only one-third the weight of tin of conventional hot-dipped, and even lacquered, chemically treated steel sheet bearing no tin at all. The facilities for production of electrolytic plate were greatly expanded, and there were indications that much of the increase in use of this type of plate would be perma-

Among other technical developments was a process devised in 1940 in Great Britain for rendering tinplate more resistant to chemical attack. It consisted of treatment of the tinplate in an alkaline oxidizing bath and had two results promising practical benefit. One was reduction or elimination of interior staining of cans by sulphur-bearing foods such as meat; the other was increased resistance of cans to external atmospheric corrosion.

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Canol Oil Project

See Northwest Territories; Yukon Territory.

Canterbury, Archbishop of

See Fisher, Geoffrey Francis.

Canton Island

See Pacific Islands, U.S.

C.A.P. (Civil Air Patrol)

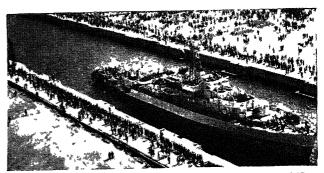
See AVIATION, CIVIL.

Cape of Good Hope

See South Africa, The Union of.

Capetown

Plans for doubling the area of Capetown, legislative capital of the Union of South Africa, were announced on Aug. 13, 1937. The scheme provided for reclamation from the sea and the laying out of an area of land equal to the existing metropolitan area; it included the entire rebuilding of the foreshore and the erection of a large modern railway station and a new city hall. The carrying out of the scheme was to last ten years, but work was held up at the outbreak of World, War II. The building of the



Graving dock completed at Capetown, South Africa, in 1945

giant Sturrock dock, however, began in April 1942 and was completed in 1945; it had a clear entrance width of about 148 ft. and an available length of 1,212 ft. The new harbour of 290 ac. was named "Duncan dock" in April 1943 in honour of the governor general, Sir Patrick Duncan. New plans for the rebuilding of the city itself were accepted in 1946 by the joint committee representative of all the interested bodies, providing for the retention of the historic Adderley street, the grand parade, the Michaelis gallery, the public gardens, the Malay quarter and the castle. It was announced on March 30, 1946, that the royal family would visit South Africa in the early months of 1947. At the end of the year Capetown began its preparations for a ceremonial welcome, which took place in Feb. 1947.

A population census taken in 1946 showed that 454.052 people were living in the city, a large increase over the 1936 census figure of 344,223.

Cape Verde Islands

See Portuguese Colonial Empire.

Carbohydrates

See CHEMISTRY.

Carbon Black

Three related factors combined during the years of World War II to affect the carbon black industry: first, 90% or more of the output of carbon black was used in the compounding of rubber; second, with the United States cut off from most of its normal sources of supply of natural rubber, it was necessary to substitute synthetic rubber; and third, the compounding of synthetic rubber required about twice as much carbon black as did the natural rubber formerly used. The combined effect of these factors can be followed in the accompanying table.

Data on the Carbon Black Industry in the U.S., 1937-45

	193 <i>7</i>	1939	1941	1943	1945
Production	255,303	262,583	297.033	296,711	526,399
Year-end stocks	50,249	65,396	59,429	102,108	51,003
Total sales	244,808	280,267	322,372	314,650	510,018
Export sales	92,127	101,914	74,083	52,456	86,887
Domestic sales	152,681	178,353	248,290	262,194	423,131
Rubber	134,792	158,311	219,751	236,737	402,193
lnk	9,058	10,965	19,099	11,765	11,412
Paint	3,080	3,191	2,920	1,972	3,711
Other uses	5,701	5,886	11,520	11,720	5,816
Natural gas used*	341,085	3 <i>47,</i> 270	365,3 <i>77</i>	315,562	431,380
Average yield †	1.50	1.51	1.63	1.88	2.32
Average value‡	3.41	2.45	3.26	3.41	4.02

*Millions of cubic feet.
†Pounds per thousand cubic feet.

Because of the fime required to build up the output of synthetic rubber, most of the increased demand for carbon black was concentrated in 1944 and 1945, and in spite of increased plant capacity, demand outstripped supply; even when the end of hostilities brought reduced military requirements, civilian needs absorbed the surplus.

In 1937 there were 24 operators with 57 plants and a

capacity of 316,832 tons; in 1945 the 22 producers and 59 plants had a capacity of 663,132 tons, indicating an increase of 104% in average plant capacity.

The postwar prospects for the carbon black industry were largely dependent not only on the rate at which natural rubber could be made available, but also on the extent to which it was deemed advisable to keep the warborn synthetic rubber industry in active operation as a safeguard against possible future interruptions in the supply of natural rubber. Since natural rubber required only about half as much carbon black as synthetic rubber, a return to natural rubber would be a severe blow to the carbon black industry; on the other hand, the failure to provide a market for at least a reasonable amount of natural rubber would have even more severe repercussions on the whole economic life of such areas as Malaya and the Netherlands Indies. (See also Rubber.)

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Cárdenas, Lázaro

Cárdenas (1895—), Mexican statesman and army officer, was born May 21, 1895, at Jiquilpin de Juarez, Michoacán, Mexico. Forced to leave school at the age of 11 to help the family finances, he worked in a small printing shop. When he was 18, he joined Francisco I. Madero's revolutionary army, advancing rapidly through the grades to general of a division. Supported by the Mexican labour unions, he was elected governor of the state of Michoacán in 1928. He became leader of the National Revolutionary party in 1930 and the following year President Plutarco E. Calles appointed him minister of war.

Cárdenas was elected president of Mexico in 1934, largely because of Calles' support, but soon after his inauguration on Dec. 1, he exiled his former political mentor. In 1938, Cárdenas expropriated oil lands belonging to foreign companies, principally U.S. and British. As a result of the seizure of the British-owned oil fields there, Mexico severed relations with Great Britain on May 13, 1938. The Cárdenas administration also exchanged several sharp notes with the U.S. government before the president finally agreed to submit the matter to a joint-claims commission.

In July 1940, Cárdenas selected Gen. Manuel Avila Camacho as his successor; Avila Camacho won the presidential elections by an overwhelming majority. On Dec. 10, 1941, three days after the Japanese attack on Pearl Harbor, Avila Camacho appointed Gen. Cárdenas commander of all land, sea and air forces on the Pacific coast. He was made minister of national defense (1943–45) and was appointed commander-in-chief of the Mexican army in 1945. He retired Sept. 2, 1945.

Cardozo, Benjamin Nathan

Cardozo (1870–1938), U.S. jurist, was born in New York city, of Jewish parentage, on May 24, 1870. Educated at Columbia university, he was admitted to the New York bar in 1891, and immediately set up practice in New York city. In 1914 he was elected to the supreme court of New York state, later joining its court of appeals. In 1932 he was appointed to the U.S. supreme court by President Herbert Hoover. Cardozo was interested not so much in the precedents and rules of law as in its philosophy and the reasons for its application. Liberal in outlook, he became known to the entire U.S. in the earlier part of Franklin D. Roosevelt's presidency, when measure after

measure involving the New Deal was challenged for constitutionality before the court. Cardozo invariably took the side of the administration, and the judgments pronounced in favour of the New Deal were usually written by him. Justice Cardozo died July 9, 1938, at Port Chester, N.Y.

Caribbean Commission, Anglo-American

See International Organizations.

Carlson, Evans Fordyce

Carlson (1896-), U.S. marine corps officer, was born Feb. 26, 1896, at Sidney, N.Y. After attending high school for a brief period, he enlisted in the army when he was 16, and was honourably discharged in 1915 as a top sergeant. Recalled to service at the time of the Mexican border troubles, he later went overseas to France during World War I. Carlson, who was mustered out in 1919 with the rank of captain, had received French and Italian decorations and a citation from General John J. Pershing. Chafed by civilian life, he enlisted in the marines in 1922 as a private. Commissioned a second lieutenant in 1923, he served in Central America and the orient. In 1937, he made a 2,000-mi. trip into China, observed battles between Chinese Communist guerrillas and the Japanese and praised the tactics and fighting ability of the guerrillas. Carlson subsequently resigned and revisited China in 1940 and 1941 as a civilian. Back in the U.S., he rejoined the marines and in May 1941 he was returned to active duty as a major.

In 1942, he was given command of a marine corps raiding unit, later known as "Carlson's raiders." Thoroughly schooled in guerrilla tactics, he and his raiders staged a successful raid, Aug. 1942, on Japanese-held Makin Island and later participated in the fighting on Guadalcanal and the invasion of the Gilbert Islands, Nov. 20–23, 1943. Wounded in the battle for Saipan, he was promoted to the rank of colonel in Nov. 1944. He retired from the marines, July 1, 1946, with the rank of a brigadier general.

Carnegie Trusts

See Societies and Associations.

Carol II

King Carol II of Rumania (1893—), eldest son of King Ferdinand and Queen Marie, became crown prince on the death of his grandfather Carol I in 1914. Carol married outside of the royal line, but the union was dissolved and in 1921, he wed the Princess Helen, daughter of Constantine, king of Greece. They had one son, Prince Mihai, born Oct. 25, 1921.

In 1925, Crown Prince Carol fled with a commoner, Mme. Magda Lupescu, and renounced his rights of succession to the throne. On the death of King Ferdinand in 1927, the crown prince, Mihai, was enthroned as king under a regency. The following year, the marriage of Carol and the Princess Helen was dissolved. Carol and Mme. Lupescu resided in England and France until 1930, when he returned to Rumania. The regency council resigned, Mihai again became crown prince and Carol became king, June 9, 1930.

In the succeeding years Carol ruled with powers amounting to a virtual dictatorship, although he permitted continuance of parliamentary forms of government. In 1938, after the rise of the fascist Iron Guard threatened the throne itself, Carol proclaimed martial law and censor-

ship. He culminated these absolutist actions with his royal decree of Dec. 16, 1938, announcing establishment of a single legal political party, "The National Renaissance

A year after the outbreak of World War II, in a lastditch effort to save his tottering regime, he appointed Ion Antonescu as premier on Sept. 5, 1940, conferring dictatorial powers on the general. But Antonescu forced Carol's abdication, Sept. 8, in favour of Mihai. With Mme. Lupescu, Carol went to Spain, where he remained under guard until March 3, 1941, when he and Lupescu escaped into Portugal.

They then took up residence in Mexico City. In 1943, Carol tried to regain favour with the Allies and hired a U.S. publicity agent to help him gain this end. After failure of this venture, Carol and Lupescu were cast back into political obscurity.

Caroline Islands

The Caroline Islands, mandated to Japan by the League of Nations and fortified in comparative secrecy after Japan left the league, formed the longest link in a chain of atolls and small islands from the "Land of the Rising Sun" southeastward toward the shipping lanes between the United States and Australia. Together with the Marshall and Gilbert Islands, these "anchored aircraft carriers" provided numerous bases for Japanese air, surface and submarine operations against Allied shipping during World War II.

Japan's two strongest bases in the mid-Pacific were in the Palau group, in the western Carolines and in the Truk group, in the eastern section of the archipelago. U.S. amphibious forces landed on Peleliu in the Palaus Sept. 14, 1944 and secured a 4,000-ft. air strip in two days of fierce fighting. They made immediate use of the base to keep other islands of the group neutralized, clearing the way for shipping in support of operations against the Philippines. Ulithi, in the northwestern Carolines, was taken without resistance Sept. 20 and its ample anchorage, protected against submarines, was put to use as a staging and repair centre for the U.S. navy.

Few other islands in the Caroline archipelago were taken by the Allies, who chose to keep Japanese bases in the group neutralized by bombing, strafing and shelling. Truk, Yap and other garrisons not captured, surrendered to the Allies after the war came to an end.

Like the Marshalls, the Carolines were of little value and interest to the nations of the world until the 1930s, when the threat of World War II gave them military significance. They were almost entirely closed to all but Japanese and their own natives after Japan began fortifying them. Missionaries, some of them from the United States, were permitted to remain into the late 1930s, however, and in fact some remained throughout the war. Apparently all who had important knowledge of the fortifying of any of these islands were forcibly detained.

As Japan encouraged emigration of Okinawans and Japanese to the islands, the native population decreased. During the generation ending about the time of the outbreak of World War II the native population, which had remained at about 50,000 for a century, had dropped to an estimated 40,000. The population of Yap, for example, dropped from 13,000 in early Spanish times to about 4,000 in 1939. Disease, limited diet, sex perversion and witchdoctor care of the sick, as well as unhealthful livingquarters, were reportedly the principal causes of the decline.

Japan instituted a medical program for all the Carolines, especially against communicable diseases, and provided some elementary schooling.

Commerce between the islands was of little volume and value. Agricultural possibilities were severely limited by the nature and size of the islands and by ignorance of crops and methods. However, the Japanese had established small dairies on Yap, Truk, Ponape and Palau before the war and had given agricultural instruction and aid to natives, on a very limited scale. Plagues made frequent inroads on poultry, making poultry breeding a costly business.

When the islands were taken over by the United States, a senior naval officer was designated as head of the island government. To his administrative staff were appointed specially trained persons whose aims were the restoration of war-damaged property, improvement in health and sanitation of the native populations, early establishment of self-governing communities, establishment of an educational program adapted to their needs and capabilities and improvement of agriculture and island industry, including handicrafts. However, a considerable percentage of the most able islanders were also employed by U.S. forces by early 1946.

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Caro Rodríguez, José Maria

See Rodríguez, José Maria Caro.

Carpatho-Ukraine

Carpatho-Ukraine, or Ruthenia, before 1918 formed part of Hungary. After World War I it was assigned as an autonomous unit to Czechoslovakia. On June 29, 1945, Carpatho-Ukraine became part of the soviet union. Area: 4,871 sq.mi.; pop. (1930): 725,357, of whom 450,925 were Ukranians (Ruthenians) and 109,472 were Magyars. According to religion, 359,167 were Greek Catholics, 112,034 Greek Orthodox, 102,542 Jewish.

Carpatho-Ukraine was the most backward and probably the poorest part of Hungary when it joined Czechoslovakia in 1918. Under the new administration, standards of living and education were efficiently raised and full democratic liberties established. At the parliamentary elections in 1935 the Communist party received the largest percentage of votes polled, 25.6%. In the first partition of Czechoslovakia, following the Munich agreement in the fall of 1938, the southern parts of Carpatho-Ukraine with a predominantly Magyar population were ceded to Hungary. The remaining territory received a far-reaching autonomy in the new or second Czecho-Slovak republic. Under the leadership of the prime minister, Mgr. A. Volozhin, Carpatho-Ukraine regarded itself as a centre for the development of a united free Ukrainian nation. The Ukrainian Nationalist party (UNO) and the national militia (Sich) worked for the idea of the liberation of the Ukrainians from Russian and Polish domination.

At the time of the second partition of Czechoslovakia in March 1939, Hungarian troops occupied Carpatho-Ukraine after a short-lived attempt of the local Ukrainians to proclaim their independence. The Carpatho-Ukraine was incorporated into Hungary, and on June 23, 1939, received a limited autonomy; its name was changed to

Carpathia with its capital in Ungvár (Užhorod).

With the restoration of Czechoslovakia through the victory of the United Nations in 1945, the territory returned to Czechoslovakia. But by an agreement between the soviet union and Czechoslovakia on June 29, 1945, Carpatho-Ukraine was ceded to the soviet union and became a part of the Ukrainian Soviet Socialist republic. Under soviet influence the Greek-Catholic Ukrainians were reported to be abandoning their faith and joining the Greek Orthodox Church.

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Carrel, Alexis

Carrel (1873-1944), French surgeon and biologist, was born June 28, 1873, at Ste. Foy-les-Lyon, France. A Nobel prize winner and world-famous scientist, Dr. Carrel was a member of the staff of the Rockefeller Institute for Medical Research, New York city, until 1939, when he retired as member emeritus. In May 1940 he returned to France, and a month later was appointed director of the Foundation for the Study of Human Relations. On Dec. 3, 1941, the Vichy government said his foundation would study "the reconstruction of man from the physical as well as the mental viewpoint." He was dismissed from this post after the liberation of France and was charged with collaboration with the Germans; Carrel denied the accusations. In late Oct. 1944 reports that he would be brought to trial were denied by the De Gaulle government. Carrel died in Paris, Nov. 5, 1944.

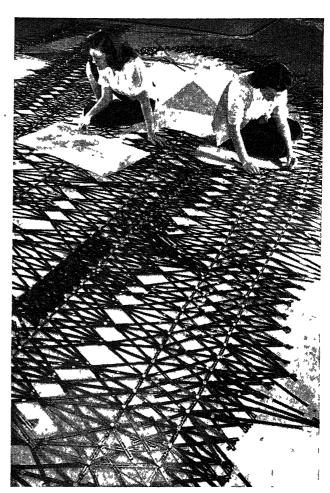
Carrots

See VEGETABLES.

Cartography

World War II interrupted most of the continuing survey activities in cartography. On the other hand, it created unprecedented cartographic activity which, in turn, advanced the mapping of the earth's surface and the techniques utilized therefore far beyond what would otherwise have occurred. For example, during the war a geodetic control grid adequate for basic mapping was established throughout most of the world. This involved the precise location of points-50 to 100 mi. apart, an undertaking which otherwise probably would not have been accomplished for decades. Again, in 1941, less than one-fifth of the world was covered with source maps adequate for aeronautical charting at 1:1,000,000, whereas by 1946 such charts existed for most of the sphere, at least in first edition sheets.

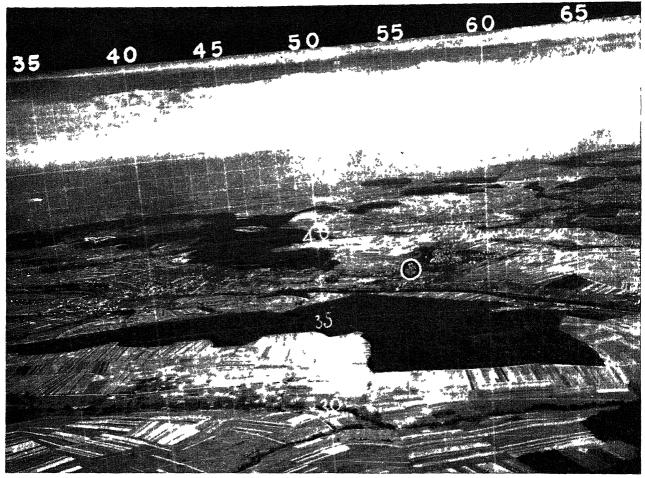
The U.S. had long lagged behind other great powers in both governmental and popular appreciation of cartography. Interest in the subject increased steadily after World War I and especially in the later '30s, as was evidenced by the appearance of the first adequate U.S. textbook, General Cartography (1938) by E. Raisz, together with Cartography by C. H. Deetz (1936), and the publication of a U.S. edition of Map Making by F. Debenham (1936). With the coming of World War II, interest grew at a tremendous rate, and after 1940 several dozen popular and professional volumes were published. World War II truly brought cartography and maps to the attention of the U.S. Probably 750,000,000 maps and charts were produced by the mapping agencies of the U.S. government alone during the war. For the first time, scores of new maps were published daily and weekly by newspapers and



Slotted templates, serving as a base for a map compilation from aerial photographs, being assembled by girl operators. Each strip represents the flight line of a plane; the intersections of the template arms locate the prominent features that serve as landmarks

other periodicals. An unprecedented demand for cartographers and draftsmen caused the establishment of instructional programs in many colleges and training centres. The great increase in personnel, together with the vast new requirements for maps, produced a rapid advance in mapping and representational techniques. Apparently the only cartographic casualty of the war was the familiar road map, but after V-J day it recovered completely its prewar annual publication figure of around 150,000,000 copies.

New Techniques.—Several revolutionary and many less spectacular advances were made during the decade 1987-46 in the techniques of cartography. Probably the most far-reaching were those connected with the science of photogrammetry-mapping from photographs. In 1936 the "Multiplex Aero-projector" had been introduced experimentally by the U.S. geological survey. This mechanism afforded precise mechanical rectification of overlapping air photographs on previously established planimetric control. This technique, although not applicable for hypsometric control in all types of terrain, was of course much faster than ground survey and cut by at least two-thirds the cost of producing accurate large-scale topographic maps. Equally important in the production of smaller scale coverage was the "Trimetrogon" method of aerial surveying developed by the Aeronautical Chart service in co-operation with the geological survey. Synchronized cameras, one vertical and two oblique, were



Pictorial map formed by superimposing a grid on a U.S.A.A.F. photo of axis terrain—one of many used in the Allied offensive across the Saar early in 1945. Such obliques were keyed to army maps; axis activities observed by artillery lookouts (circle) were plotted and reported to fire direction centres, where the information was used to give batteries range and direction

used to photograph strips from 15 to 25 mi. wide from altitudes of 20,000 to 40,000 ft. at a cost of about \$.25 per sq.mi. The speed with which mapping could be accomplished by this process was indicated by the record of a unit of 200 persons in the geological survey. In a sixmonths' period during the war, this unit produced aerial navigation charts covering 2,000,000 sq.mi.

During the decade, two long-established conventional procedures were generally superseded by other methods. Until about 1938 almost all precise maps and charts had been engraved on copper plates. After that time, many refinements of the cartographic-lithographic processes eliminated the need for copper plates and contributed greatly to the flexibility and productivity of the field. The decade also saw, in the U.S. at least, the replacement of hand lettering by mechanically produced lettering (and symbols) for application to the drawing surface. Lettering, known as "stick-up," could be produced by photographic or printing techniques and allowed for better design and standardization.

The refinement of the lithographic processes with respect to cartography was accompanied by an increased interest in the representation of terrain. Both the geological survey and the Aeronautical Chart service carried on investigations in the introduction of the shaded relief map utilizing aerial photographs as source material.

Wider use of this technique gave promise of permitting easier recognition of surface features from aircraft and of increasing popular appreciation of the topographic map. Several attempts were made in the U.S. and Germany be fore and during World War II to produce precise shaded relief by half-tone photography from models, but success was limited.

Techniques of model making and reproduction also made great strides after 1936. Accurate models were produced and reproduced in rubber, steel, aluminum, vinylite and other plastics. A device for the projection of contours in three dimensions so that a model could be carved to the apparent surface so created was developed during World War II. Also invented was a mechanism which allowed orthographic projection of planmetric data on a three-dimensional surface and thus increased the accuracy of the finished product. Increased use of radar navigation seemed likely to further the demand for precise terrain representation by actual relief models as well as shaded relief maps.

With development of better and cheaper half-tone and colour lithographic processes, the airbrush became standard equipment in the modern drafting room. The general quality of maps, especially those in the smaller scales, immeasurably improved with the greater opportunity for the employment of gray and colour values.

Techniques for the representation of geographical relationships were widened, partly because of the war and partly because of the entrance of commercial artists into cartography. Perhaps the most notable advance was the attempt to popularize the so-called "global" relationships through the use of the more visual map projections such as orthographic, azimuthal equidistant and others (mostly azimuthal), many of which were employed in the polar phase. This was accompanied by a visual revolt against the "evil" Mercator and some of the time-honoured projections in scientific cartography. The movement was exemplified by the titles of two published atlases: Look at the World, by Richard Edes Harrison and Atlas of Global Geography by E. Raisz.

Increased emphasis on the "global" aspects of the world community brought forth many publications concerning the appreciation of cartography as a medium to help its understanding, as well as some interesting devices to aid in their interpretation. Among the more notable of these were the transparent plastic hemispheres (showing air line distances, etc.) devised by S. W. Boggs of the department of state for use on globes, the "Likaglobe" of Irving Fisher and the less important but widely publicized "Dymaxion" globe of R. Buckminster Fuller. The last two were world maps projected on the flat faces of an icosahedron and a polyhedron respectively, and could be joined in the forms of these solid bodies to simulate the globe surface. In the field of flat map projections and their construction there were several innovations and advances, among which were the "Bi-Polar Conic Conformal" and the "Miller Cylindrical" by O. M. Miller, "The Nomograph as an Instrument in Map Making" by R. E. Harrison, an equal-area projection of the hemispheres by O. S. Adams and many others of less significance.

New Types of Maps.—Several new kinds of maps and map uses were developed during the decade. Perhaps the most important was the result of the vast amphibious operations of World War II. The data on the normal prewar hydrographic chart and topographic map ceased at the shoreline, with the result that there were few maps, outside coastal areas of the U.S., which showed both land and water data. This deficiency resulted in the U.S. army and navy co-operating in the development of the so-called "map-chart," which appeared likely to become a standard military type of map. Technically interesting were "Lastex" and cloth maps produced in quantity for survival purposes, fluorescent maps and charts for "dark" navigation, and radar and Loran charts for use with new navigational devices. In the field of geographical cartography, mention should be made of the movement toward "Landscape," "Land-Use" and "Land-Type maps" as exemplified by the work of E. Raisz.

During the first part of the decade most of the mapping activities of Europe were concerned with the expansion of detailed and special coverages since most of Europe had been surveyed for many years, although not on consistent geodetic control. The "Land Utilization Survey" of Great Britain had been completed, although not all sheets were published prior to the war. As soon as the war began, all resources of the countries involved were dedicated to military purposes, and a vast amount of compilation (as distinguished from surveying) was car-1ied on, especially by the British through the Geographical Section general staff and co-ordinated survey departments in the colonies and dominions. Through the cooperation of the military mapping agencies of Britain and the U.S., who apportioned the world for greater coordination, maps were quickly compiled and reproduced for large areas in the middle east, far east and Africa.

Cartography in Germany was early brought under the centralizing influence of the national-socialist state, and by the beginning of the decade mapping in the reich was notably more co-ordinated than in any other country.

During the war German cartographers worked out an "amphibious" map similar to the map-chart of the U.S. Much coverage was accomplished along the coasts of France, Italy, Dalmatia, Greece, Norway, Denmark and the coasts of the North and Baltic seas. In addition, a significant amount of survey work was done in the Libyan desert. The Kartographie of Prof. Max Eckert-Greifendorff, Germany's great authority on the subject, appeared in 1939 shortly after his death; the volume dealt with the relation of cartography to modern culture. Little was known of mapping in the U.S.S.R. except that cartography made tremendous strides and extensive areas were being surveyed. Compilation and survey coverages of China, Iran and other parts of the middle and far east were greatly accelerated by the war, but much of the work was of the second order of reliability because of the lack of precise geodetic control. Among several important atlases published in the early part of the decade, were Atlas van Tropisch Nederland (1938), and volumes I and II of the Great Soviet World Atlas (1938).

Mapping and Charting.—The detailed mapping of the western hemisphere proceeded at a relatively slow rate except for limited areas of strategic importance. An important achievement was the completion, during the war, of the American Geographical society's Map of Hispanic America at a scale of 1:1,000,000. The Giant Relief Model of the United States (1:250,000) at the Babson institute was also completed during the decade.

During the decade the U.S. geological survey of the department of the interior published almost 2,000 different topographic maps. These maps, based on control established by the coast and geodetic survey, became the standard detail maps of the U.S. Somewhat more than 10% of the area of Florida, Illinois, Indiana, Louisiana, Maine, Missouri and Nevada was mapped; the mapping of Hawaii and Puerto Rico was completed, and coverage in Alaska was extended.

During the war experts and technicians of the geological survey were actively engaged in compilation and survey work in co-operation with the armed forces. New terrain data for more than 7,500,000 sq.mi. of the earth's land area was made available, primarily for aeronautical pilotage charts.

Prior to the outbreak of World War II, the coast and geodetic survey (q.v.) of the department of commerce continued to extend the triangulation and levelling control of the U.S. and its possessions. Approximately 500,000 sq.mi. were brought under 1st and 2nd order triangulation during the decade, and some 75,000 mi. of 1st and and order levelling was accomplished. In addition to the extension of the geodetic control the survey's normal hydrographic and topographic survey activities added more than 300,000 sq.mi. of hydrographic charting and more than 20,000 sq.mi. of coastal topography to the map resources of the nation. The latter figure included approximately 30,000 mi. of shoreline. Much of this work was done photographically. About 10% of the above survey work was carried on in Alaska and in the Aleutian and Philippine Islands. In 1941 the survey, in co-operation with the department of state, initiated a program of co-operation with the other American republics, primarily concerned with magnetic observations, which was designed to lead toward the establishment of consistent geodetic control for the western hemisphere.

Early in the decade the coast and geodetic survey completed the first aeronautical charting of the U.S. and was

engaged in the preparation of revisions and airport plans when the war required extension of compilation work to foreign areas. Several thousand aeronautical charts were issued on relatively short notice. Although the demand for the maps and charts of the coast and geodetic survey steadily increased, the impact of the war could be gauged from the fact that while some 500,000 copies were issued in 1936, the annual demand during the war rose to nearly 15,000,000.

During the first part of the decade the hydrographic office of the U.S. navy was engaged primarily in extending the charting of the Caribbean, the north coast of South America, and the Atlantic and Pacific approaches to the Panama canal. With the acquisition of defense bases prior to U.S. entry into the war, hydrographic surveys were made of many areas in the Atlantic, including parts of Greenland, Labrador, Newfoundland, British West Indian islands and the Galapagos Islands. During the war most of the surveying resources of the hydrographic office were devoted to charting as rapidly as conditions would permit many areas in the southwest Pacific, including the waters of New Caledonia and the Solomons, New Hebrides, Samoan, Fiji, Marshall, Mariana, Ellice, Gilbert, Society and Palau Islands.

Although the technique of deep-sea sonic sounding had been in operation for several years prior to 1937, the data obtained by this method increased tremendously during the following decade and probably more than 200,000 nautical mi. of sounding lines were made. Sufficient depth data became available during the decade for the publication by the hydrographic office of bathymetric charts, showing the configuration of the ocean bottom, covering the South Pacific ocean and the Caribbean. Four years of wartime research produced the interesting *Ice Atlas of the Northern Hemisphere*.

Extensive naval surface and aeronautical operations of the U.S. navy placed an unprecedented demand on the hydrographic office during the war. In the early part of the decade the office had on issue some 2,800 nautical and less than 100 aeronautical charts, the annual distribution of which amounted to less than 1,750,000 copies. In 1945, approximately 5,200 nautical and 450 aeronautical charts were on issue; in the peak year of activity during the war more than 40,000,000 copies were printed.

The U.S. army was faced with a similar problem of providing hitherto unheard of numbers of aeronautical charts. In 1941, the Aeronautical Chart service was organized within the army air forces and by leaning heavily on the compilation resources of the geological survey and the coast and geodetic survey was able to accomplish a phenomenal record in mapping. By the end of the war it had published thousands of charts in several important series, probably the most significant of which was the socalled "Pilotage Charts," a relatively consistent coverage of the world at a scale of 1:1,000,000. This monumental task could not have been accomplished except for the great strides which had been made in the science of mapping from photography. By trimetrogon mapping alone some 15,000,000 sq.mi. of the earth's surface (approximately five times the area of the U.S.) were mapped in South, Central and North America, Europe, middle east and far east.

Prior to the formation of its map service in the corps of engineers, the U.S. army had operated a small mapmaking establishment almost entirely occupied with strategic areas of the U.S. and its possessions. Most of the

resources of the new organization were employed in the compilation of new maps of the far east, and in the revision and reproduction of existing topographic maps. Nearly 350,000 sq.mi. of new or improved mapping was accomplished, including some 200,000 sq.mi. in China, Japan and the Pacific islands. The production problems were staggering. Some 41,000 different topographic maps, city plans, target charts, etc. were compiled, revised or simply reproduced in four years. Much of the lithographic work for the Aeronautical Chart service and other mapping units both in the U.S. and elsewhere was accomplished by or through the army map service. Almost 500,-000,000 copies were produced and shipped. This total did not include the many thousands of maps compiled, drawn and lithographed in the many field establishments of the corps of engineers.

* * *

SMALL-SCALE cartography increased in importance, particularly in the U.S., during the decade. Although the war provided the greatest stimulus, the increasing concern with this branch of cartography was evidenced by the work of R. E. Harrison, E. Raisz and others early in the decade. During the war many thousands of "specialty" maps (maps depicting a limited number of earth phenomena) were issued by various government agencies such as the Office of Strategic Services, the department of state and the Board of Economic Warfare, and the techniques for their preparation were considerably advanced. Associated with this movement was the publication of many new atlases. Most of those published in the U.S. were for popular consumption, such as Encyclopædia Britannica World Atlas (1942), Look at the World: the Fortune Atlas for World Strategy by R. E. Harrison and Fortune (1944), Global War, an Atlas of World Strategy by E. A. Mowrer and M. Rajchman (1942), and Atlas of Global Geography by E. Raisz (1944).

A significant cartographic development during the decade was the organization in 1941 of the American Congress on Surveying and Mapping and the initiation at that time of the *Bulletin* of the congress, published as a quarterly journal. (See also Geography; Geology; Photography.)

(A. H. R.)

Cartoons

"Cartoonist" had become a broad term by 1946, covering as wide and varied a field as the title doctor, which might mean anything from a brain surgeon to a chiropodist. Like the medical profession, cartooning, too, had become highly specialized. Not so long ago, a cartoonist was one who expressed editorial opinion in pictures. Those primarily engaged in entertainment were known as comic artists.

There was still the editorial, or political, cartoonist of the Thomas Nast and Sir John Tenniel tradition, and it is that specialty which will be considered here except for a few borderline cases which also will be noted.

During the decade 1937-46, cartoonists everywhere had only one basic subject, war. Beginning with the "little world war" in Spain and Japan's "undeclared war" in China the decade was one of continuous explosions or the ghastly silences of the war of nerves. Local issues, even larger national issues, such as the so-called supreme court packing plan and the third term issue in U.S. presidential elections, were secondary. Armed with rapier, bludgeon, block-busters and laughing-gas, cartoonists entered the fray.

In Germany the daily cartoon, as used in the U.S. and England, was unknown. Cartoons before World War II



Above: Drawing of Spanish civil guardsmen, by Luis Quintanilla who was active in the civil war in Spain and who spent four months at the various fronts drawing firsthand impressions of total war

Below: "The Vichy Government in its New Residence," by the Russian cartoonist, Efimov, which appeared in *Krasnaya Zvezda* after a 1944 report that Pétain and Laval had been abducted to Germany and were forbidden to meet. They are pictured writing their respective memoirs





Above: "We Both Officially Deny this is Happening," one of David Low's satires on the nazi capacity for official self-delusion. This cartoon appeared in the London Evening Standard during 1941 and was later reprinted in Years of Wrath, a collection of Low's drawings

Below: Humour based on self-criticism distinguished this French cartoon by Chancel, printed in Carrefour in 1946. The dialogue which accompanied it read: "First we must produce." "Produce what?" "Deputies"



were largely confined to weekly publications such as Simplicissimus of Munich and Kladderadatsch of Berlin. Under Josef Goebbels, cartooning seems not to have thrived in nazi Germany.

In the soviet union, cartoonists and graphic artists contributed their special skills toward crushing the invader. With Hitler's armies virtually at the gates of Moscow, and Leningrad in a state of siege, the Russians carried on in the cartoon field. Skilled professionals were recognized by the authorities as important factors in war and their talents were integrated into the general war effort.

The cartoons signed Kukryniksy in Pravda were of unusual interest not only because of their high quality, but also because they were the joint product of three artists working together. Mikhail Kupriianov, Porfiril Krilov and Nikolai Sokolov were probably considered an unholy trinity by Goebbels and company. Their pen name was a combination of the first syllables of the three artists' names. All three worked on the same drawing, made alterations, and, judging by results, this unusual arrangement worked successfully. Their work was not confined to newspaper cartoons. They also drew a large number of striking and effective war posters in colour.

Boris Efimov, another great Russian cartoonist, was only one person. An expert in caricature, he portrayed Hitler as a gorilla, a ridiculous gorilla, not really human, yet lacking the animal dignity of a real gorilla.

English cartooning, under the outstanding leadership of David Low, carried on almost on a "business as usual" basis during the decade. Low, at the peak of a long career, and with a background of experience and understanding of world events, made a valuable contribution to history in his cartoon record of events. He caricatured the principal leaders of Allied, neutral and axis countries and characterized them in a manner which should

"British Plane," Pulitzer prize cartoon of 1941 by Herblock (Herbert L. Block) of N.E.A. Service, Inc.



clarify for future generations the men and events of World War II.

Despite the bombings which made London and all England practically front-line positions, Low and other English cartoonists were not strafed out of their sense of humour. A good example was a cartoon by Strube of the Daily Express entitled "After the Raid." It showed a typical English housewife peeking from a backyard airraid shelter. On the top of the shelter is her "common people" husband with his warden's tin hat and gas mask bag. "Is it all right now, Henry?" she asks. "Yes, not even scratched," says he, as he proudly inspects a large watermelon growing on a vine atop the shelter.

R.A.F. planes on night raids dropped a series of unsigned V-for-Victory comic cartoons on occupied Europe. There were no captions or lettering on the drawings so the language problem was automatically solved. One such drawing showed a horrified Hitler at table. His two weiners on the plate formed the V sign. Another showed Hitler discovering the V mark on the ample seat of Goering's pants.

Czechoslovakia produced well-printed colour cartoon posters, notably those by A. F. Peele, in modern poster style, with excellent compositions and a real feeling for caricature. Stephen Roth, another able Czechoslovak cartoonist, contributed work of a high order. His style of outline, solid black and gray, was of the David Low type of drawing.

DeGroene (The Green), Dutch weekly, had to go underground during the occupation. In a book of cartoons by L. J. Jordaan, the trade-mark in poster style showed a green frog diving into the water. Innocent enough to look at after the war, but full of significance in wartime. The Dutch did not need to be told the identity of the green frog or the significance of going under. This was an example of the graphic ingenuity used to carry forbidden thoughts under the very noses of the Germans. Jordaan's cartoons, in the style of old steel engravings, had a hard, tough quality of accuracy and detailed realism.

Arthur Szyk, Polish cartoonist, was purely a war product. A noted miniature painter and illustrator of illuminated books in the old tradition, he brought his copiously detailed style to the field of caricature and ridicule of nazism. Szyk, in a way, seemed almost like a mediaeval knight in full armour riding into modern war, for his style was that of the middle ages. Ancient figures which had been frozen into history, in hand-illuminated volumes, were transformed into nazi monsters. Museum pieces became Buchenwald butchers, with all the feeling a Pole could master, and yet retained the all-over pictorial quality of a Biblical illustration by a monk of the middle ages. When Hitler took over Europe, Szyk transferred his base of operations to the U.S. and continued his cartoon barrage. Collier's published many of his works as covers.

The precious old Chinese art of the scholars gave way to the necessities of war, and occidental cartoons became the models of the younger artists. At first, when the Chinese government followed a policy of appeasement toward Japan, no caricature of the Jap was permitted, and cartoons were, of necessity, subtle insinuations into which meaning had to be read. During that period one typical cartoon, delicate in design and execution, showed a huge snake with its head and forepart through a gate in the Great Wall. Behind the wall the body of the snake stretched its coils over what had been Manchuria. The title was "Coming Down," and wise Chinese did not need to be told the identity of the snake or its travel ambitions. Later, in 1937, when the lid blew off, the Chinese artists

followed occidental cartoons in becoming realistic and less indirect, and their powerful messages reached the great mass of people, as no delicate, scholarly art could have done.

In Spain, Louis Quintanilla, an artist in every sense of the word, carried on in the great Goya tradition. Quintanilla's series of drawings entitled "Franco's Black Spain" were an excellent example of the rather rare combination of art and deep understanding of subject matter. Modern in style, delicate of line, having the aspect of etchings, they formed a savage indictment of the Franco regime, its cruel Moors and ruthless German allies. These drawings were not made for a daily publication as political cartoons usually are. They were the work of an artist, a native of the country, recording his reactions to what he saw, and they might take their place in history as a part of Spain's diary which Goya illustrated in his time.

France, the mother of great artists and great cartoonists, seems to have been blacked out by the nazi-Vichy regime. Its free publications began to reappear in limited form after V-E day with contributions by such political cartoonists as Pol Ferjac, Henri Monier, Grove and others. The work of Roger Chancel in Carrefour, literary and political weekly, suggested that the tradition of Daumier and Forain still lived, and that it would not be long before French cartoons would take their rightful place in the world. One of Chancel's drawings, with a sharp Gaelic touch and a play on Churchill's "Iron Curtain" phrase, showed a huge Uncle Sam surrounding France with a celluloid curtain of "Motion picture monopoly."

In the U.S., as in England, the free tradition of cartooning remained uninterrupted. But full advantage of this freedom was not taken, partly because of war restrictions but largely because wide syndication of cartoons and the development of newspaper chains tended toward broad generalization in controversial matters. Stress was placed upon entertainment rather than upon sharply aimed and pointed comment.

In the late 19th and early 20th centuries, there were giants like Thomas Nast, whose powerful pictorial attacks broke up the Tweed ring in New York. Later there was a school of cartoonists like Robert Minor, Boardman Robinson and Art Young, who passionately attacked social injustice and political corruption. These three and others found an outlet for their opinions and emotions in the old Masses, a publication with a broad left-wing policy of social protest.

In the decade 1937–46 Bill Gropper represented the left wing, but the *New Masses*, where his work appeared, was definitely a Communist party organ and there was no room for the resilience and individualism which cartoonists for the old *Masses* enjoyed. "Ding" Darling for many years represented conservative thought, and cleverly translated his opinion into the homely pictorial idiom of everyday life, particularly rural life.

Men like Joseph Parrish and Carey Orr of the Chicago Tribune reflected the highly individual nationalistic views of Col. Robert McCormick, the Tribune's publisher. The same was true of the cartoonists for William Randolph Hearst, also a highly individual nationalist.

Generally speaking, however, cartooning was linked with the character of daily journalism. U.S. newspapers with a few exceptions lost their individuality; their editorial pages, by and large, lost the sharp tang of the days of Horace Greeley, Henry Watterson and Frank Cobb, and cartooning followed the same trend.

As if to fill a vacuum, personal columns of opinion became more and more popular. Newspapers purchased



Henri Monier (left), Pol Ferjac and Grove, French political cartoonists of Action, La Marseillaise, Franc-Tireur and other periodicals

the writings of Harold Ickes, Dorothy Thompson, Westbrook Pegler, Marquis Childs and others, and gave them the privilege of writing as they pleased.

For some reason newspapers dissociated themselves from opinions expressed in signed columns to a much greater degree than in the publication of opinionated cartoons. It would have been interesting to see what contributions Ickes or Pegler would have made to cartooning had their talents run to caricature.

Just as the war produced the simple writing of an Ernie Pyle, so it also erupted the young artist, Bill Mauldin, a sort of Bruce Bairnsfather of World War II. Mauldin was not, strictly speaking, an editorial cartoonist but he was the pictorial spokesman of the combat enlisted man. His work appeared in the army publication, Stars and Stripes. His lean, bewhiskered and rather grim characters were real fighting troops, and if they had their own ideas about new young 2nd lieutenants, Mauldin insinuated them into his drawings. One such cartoon showed a spick and span youngster with bright new eagles on his shoulders meeting, in the war zone, a tough old enlisted man with beard, war-worn uniform, and something of the old man of the sea about him. The young air force officer said in surprise, "Uncle Willie!"

As Mauldin grew in popularity some of the army brass hats tried unsuccessfully to curb his humour and channel his work along different lines, which was further testimony of his effectiveness.

A renaissance of U.S. cartooning seemingly depended upon a renaissance of U.S. journalism as a whole. Its fortunes, for better or for worse, seemed bound up with the restrictions of institutional opinion. Until publishers felt they could indulge themselves in the luxury of a pictorial jester at court, cartooning in the best sense of the

word had to take its place on the counter among the widgets and gadgets of daily journalism, along with the daily horoscope, advice to the lovelorn and the crossword puzzle.

The days when a Hogarth could draw his pictures, make his plates and prints, and sell them as separate items had been replaced by quantity production. (See also Comic Strips; Humour, War.)

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Casablanca Conference (1943)

See International Conferences, Allied (World War II).

Casein

See CHEMURGY; PLASTICS INDUSTRY.

Casey, Richard Gardiner

Casey (1890—), Australian politician, was born Aug. 29, 1890. Educated at Melbourne university and at Trinity college, Cambridge, he served as liaison officer between the Australian government and the British foreign office for seven years. After leaving this post in 1931, he entered Australia's house of representatives. During his nine-year tenure in the house, he also held the posts of federal treasurer, minister in charge of development and minister for supply and development. In 1937, the Commonwealth government sent him to London for the coronation and imperial conference, and in 1939 he again represented his country at the London conference on the conduct of the war.

Casey left the house of representatives in 1940 to become minister to the United States. Prime Minister Winston Churchill recalled him in 1942 and placed him in the United Kingdom war cabinet as minister of state in the middle east. On Dec. 24, 1943, it was announced that he was named governor of Bengal in what appeared to be a government move to alleviate the famine situation in that province. His resignation was announced Nov. 7, 1945.

Casualties, World War II

See DEATH STATISTICS; MILITARY MEDICINE, U.S.; WORLD WAR II.

Cataracts of the Eye

See Eye, DISEASES OF.

Catastrophes

See DISASTERS.

Catholic Church, Roman

See ROMAN CATHOLIC CHURCH.

Catholic Community Service, National

See Societies and Associations.

Catholic Library Association

See Societies and Associations.

Catholic Organizations for Youth

In Nov. 1937, the first major step was taken in the development of a national Catholic program for youth. The annual meeting of the Catholic bishops of the United

States approved the development of a National Catholic Youth council. It was recognized at that time that the numerous Catholic youth groups, local, regional and national, required a co-ordinating and federating agency in order to establish some national pattern to meet national problems. The promotion of this National Youth council was placed in the charge of the National Catholic Welfare council, the bishops' official national co-ordinating agency.

In 1938 there was established in the executive department of the National Catholic Welfare conference a bureau whose chief responsibility was to set up the framework and supervise the activities of the National Catholic Youth council. Meetings were held with regional and national leaders in the field of Catholic youth work. The first external activity of the newly created national program was in relationship to the then active American Youth congress. Catholic youth participation in this national federation of youth groups was channelled through the National Catholic Youth council. Moreover, the interests of Catholic youth in relationship to governmental programs such as the Civilian Conservation corps and the National Youth administration were expressed through the newly created council.

In 1940 it was realized that both the National Catholic Youth council and the interests of Catholic organizations generally required an expanded national centre. At their annual meeting in that year, the bishops of the Catholic Church in the U.S. raised the Youth Bureau of the National Catholic Welfare conference to a full department and assigned Bishop John A. Duffy of Buffalo, N.Y., as the chairman of this new department.

Moreover, the scope of the National Catholic Youth council was enlarged. A college and university section was established within which a co-ordinating and federating program for students could be developed. The Newman Club federation, a national grouping of Catholic clubs on state and nonsectarian university and college campuses, was brought within the framework of the new section. The National Federation of Catholic College Students, organized in 1937 and unifying student groups in the 200 Catholic colleges and universities, was likewise accepted as a component part of the college and university section of the National Catholic Youth council.

After 1940 the youth department of the National Catholic Welfare conference continued to serve a threefold responsibility for Catholic youth organizations in the U.S. In the first place, it became a centre of reference and information for programs and activities carried on throughout the U.S. under Catholic auspices. Secondly, it was charged with developing both in the general communities and in college and university life the co-ordinating and unifying program contained in the National Catholic Youth council.

Finally, this department served as the official representative of Catholic youth groups in relation to and co-operation with governmental and nongovernmental youthserving agencies and programs.

Below the national level, a considerable development of regional Catholic youth programs took place in all parts of the U.S. after 1937. In the U.S., there were 121 diocesan divisions in 1946, each under the supervision of a bishop. Prior to 1931 none of these dioceses had an officially organized diocesan youth program. In that year the Most Reverend Bernard J. Sheil, auxiliary bishop of Chicago, established in that city a diocesan Catholic youth organization. In the several succeeding years, other dioceses imitated this pattern. During the decade 1937–46,

youth programs with a central office and professional staff under an officially appointed director were established in the vast majority of dioceses in the U.S. By the fall of 1946, 107 of the 121 dioceses had established diocesan youth-serving and co-ordinating agencies in their areas.

The program of these diocesan agencies or bureaus differed from place to place in scope and in the multiplicity of functions. In the larger centres such as Chicago, Detroit, New York and Boston, an extensive program of youth activities and services was carried out. The staff and budget of these larger agencies were proportionately extensive. In smaller dioceses, particularly in rural areas where needs and circumstances were less considerable, the diocesan program was less extensive in scope and function. However, the common objectives were found in all these diocesan bureaus. Assistants to local units, a provision for volunteer training, unifying and co-ordinating activities beyond the local level, and representation and co-operation with other community groups continued to be the chief features found in diocesan youth programs.

During the decade, local groups felt the impact of these diocesan programs variously known as the C.Y.O., the Diocesan Youth department, the Catholic Youth council office, etc. The standards of activities in local organizations were raised considerably. The wider problems of youth and projects to meet these needs were submitted to sponsors of local parish groups throughout the U.S. Informal educational practices and recreational activities developed by agencies outside the church were brought to the attention of local groups and included in their programs. An outstanding example was the utilization of the scouting program in many Catholic youth groups throughout the country.

In spite of World War II and in some measure because of it, national Catholic youth-serving programs extended their activities. The Sodality of Our Lady, with its national office located at 3742 West Pine Blvd., St. Louis, Mo., increased its local units and general membership. The Junior Catholic Daughters, 39 Manchester Terrace, Mt. Kisco, N.Y., extended its program for girls into 22 states and 3 territories. The Columbian Squires, a youthserving project of the Knights of Columbus, with national offices at 45 Wall St., New Haven, Conn., had shown considerable activity during the late 1930s. With the advent of war, this program for high-school boys was somewhat curtailed because of losses of staff and older boy counsellors. After the conclusion of the war, a broad program of organization and extension was initiated in conjunction with the councils of the K. of C. throughout the country.

Two new organizations of Catholic youth developed in various parts of the country. One program was based upon the excellent experience of Belgian and French leaders in relation to working youth, viz., Jeunesse Ouvrière Catholique (J.O.C.) numbering tens of thousands of young men and women in all parts of Europe. Even the war did not prevent the extension of this movement. In the U.S., certain Catholic leaders felt that this form of youth organization met a distinct need of the times. Groups of young people were organized to apply the J.O.C. method to the U.S. scene. Formed into small groups, they met to study the social, cultural and economic conditions affecting youth in their particular environment. On the basis of these observations, they instituted a systematic program in cooperation with any other group so interested to bring about beneficial changes in the milieu in which they were situated. Basically, this program of the Young Catholic Workers was a Christianization of the environment of young workers. By observing, judging and acting on environmental conditions, they would raise the general level of economic, community and family life. Such groups multiplied during the decade and were to be found from Manchester, N.H., to San Francisco, Calif.

The second of these new developments was the Young Catholic Student movement, working along the same lines as the Young Catholic Workers, but in college and university life. They hoped to bring a more Christian and enlightened attitude to students' environment. Approximately 100 such groups of students were functioning in both Catholic colleges and Newman clubs throughout the country in 1946. A centre for this activity was found at Notre Dame university, Ind., where publications and correspondence were related among the individual units.

Much literature was developed during the decade concerned with various activities of Catholic Youth organizations in the U.S. Both diocesan youth bureaus and national youth-serving organizations contributed to this literature on specific phases of their programs. To meet a growing need both inside and outside the church, one booklet was published which described in summary fashion the organization, membership and program of all recognized national and regional Catholic youth programs in the U.S. The Catholic Youth Directory, edited and published by the youth department of the National Catholic Welfare conference with headquarters at 1312 Massachusetts Ave., N.W., Washington, D.C., included in 1944 an outline of the structure and activities of all Catholic programs beyond the local level.

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Catholic Rural Life Conference, National

It was in 1923 that Father Edwin V. O'Hara, later bishop of Kansas City, Mo., and a group of priests interested in problems of the land banded together to form the National Catholic Rural Life conference. The founders had two things in mind: to bring religion in its fullness to rural dwellers and to so improve their socio-economic status that they might obtain at least that amount of material prosperity which helps to the practice of virtue.

Through the years, and especially during the depression of the 1930s, these objectives were further developed and clarified. At the end of the decade 1937-46, the general aims of the conference could be stated thus: (1) To care for underprivileged Catholics living on the land; (2) to keep more Catholics on the land; (3) to settle more Catholics on the land; (4) to convert the non-Catholics on the land. These objectives derived from the realization by members of the conference that agriculture as a way of life had been followed by a disproportionately small number of Catholics. In a reversal of this tendency was seen a means of encouraging family living of a sort calculated to strengthen the family as the basic unit of society. By having Catholics live in reasonably prosperous areas where basic social services and religious facilities were available, both civic and religious life would be strength-

During the decade 1937-46, conference headquarters were in two cities. Until 1940, the Reverend James Byrnes was executive secretary. Because he resided in St. Paul, Minn., the headquarters were located there. After 1940 the office of executive secretary was held by Monsignor Luigi Ligutti, of the Des Moines diocese. In 1941 he

brought the headquarters to Des Moines, Ia., long a centre of agricultural activity and organizations. A permanent headquarters building was established in that city, at 3801 Grand avenue.

During the same period, the official publication of the conference varied. At first it was the Catholic Rural Life Bulletin. At the 1941 convention it was decided to issue a quarterly, to be called Land and Home. The first number appeared in Feb. 1942. In addition to the official magazine, the conference published and distributed a great number of leaflets, pamphlets and folders designed to forward its educational and servicing program. Through a book service, operated at headquarters, books and pamphlets of other publishers were made available to those seeking information on rural problems.

The decade witnessed considerable development in the organization and administration of the conference. Reverend William T. Mulloy (later bishop of Covington, Ky.), president from 1935 to 1937, was again elected to that office at the 1946 convention, after having served as acting president from the spring of 1946 when reasons of health led Bishop William A. Griffin, of Trenton, to resign. Bishop Griffin had served as president from the 1945 convention. Other presidents during the period were: Rt. Rev. Mgr. Luigi G. Ligutti, 1937-39; Rt. Rev. Mgr. Vincent J. Ryan, later bishop of Bismarck, N.D., 1939-41; Most Rev. Aloysius J. Muench, bishop of Fargo, N.D., 1941-43; Most Rev. Joseph H. Schlarmann, bishop of Peoria, Ill. The bishop of Des Moines, Ia., Most Rev. Gerald T. Bergan, served as ecclesiastical moderator of the conference.

Among the publications setting forth the philosophy of the National Catholic Rural Life conference may be mentioned Rural Life Objectives, a series of papers begun by Father James Byrnes when he was executive secretary. In 1939 appeared the Manifesto on Rural Life, a volume correlating statements gleaned from papal encyclicals, pastorals of bishops, and other authoritative sources, in such a way as to make explicit the religious and sociological principles for which the conference stood. In 1940 Monsignor Ligutti, the executive secretary, collaborated with Rev. John C. Rawe, S.J. in the publication of Rural Roads to Security, a study of rural trends and principles governing land use, family living and community activity. The conference also continued to make regular use of the press to spread its ideas. Each week a syndicated column appeared in approximately 70 of the diocesan papers.

The National Catholic Rural Life conference took final juridical form on May 16, 1944, when its constitution and by-laws were adopted by the board of directors of the original corporation, consisting of Bishop Muench, Bishop Bergan and Monsignor Ligutti. The drafting committee of the new constitution had worked under the direction of Bishop Schlarmann, who in 1944 was president of the conference. The legal effect of the new constitution was to make of the whole conference one corporation. Up to the time of its adoption the members had been held together by a more or less informal agreement.

The activities of the conference expanded with the years. By the end of 1946, it had rural-life directors in approximately 70 dioceses of the United States. These priests, appointed by their bishops, assumed the responsibility of promoting the objectives of the conference within their respective dioceses; they formed a committee of their own within the conference, having their own chairman.

The conference also organized, either from headquarters

or through the diocesan directors, rural-life summer schools and institutes in which priests, sisters and lay people met together to discuss mutual problems and participate in discussion groups. These institutes, through their influence upon teachers and parents, did much to give a more rural orientation to Catholic schools located outside cities. They became an integral part of the conference's educational program. During 1945, there were 82 schools and institutes, with a total attendance amounting to 22,000. A somewhat similar educational function was the fostering of study groups in seminaries throughout the country; there were about 35 such groups at the end of 1946, composed of clerical students interested in preparing themselves more effectively for work in rural areas. The conference prepared special study outlines and literature for these students.

One of the conference's functions was to maintain contact with other organizations and agencies concerned with rural problems and agricultural matters. This function was indicated in article II, section 2 of the new constitution: "the conference shall . . . maintain friendly contact with other rural life associations; shall collaborate, wherever feasible, with such and other organizations and with governmental agencies that seek to protect and foster the well-being of the rural population; and shall interest itself in every worthy effort to bring the blessings of wholesome living to our rural population."

In carrying out this function the executive secretary and other conference members discussed rural problems and agricultural policy with governmental and nongovernmental groups, always advocating action which seemed calculated to strengthen the Christian family living on the land.

One of the most impressive activities of the conference was its annual convention. During the war years these could not be held on a national scale, but merely as regional or local events. Before the war, however, and again in 1946 the conventions drew hundreds of people from throughout the United States and Canada, along with thousands of residents of the convention city and its environs. In 1938 about 7,000 persons attended the open meetings of the convention at Vincennes, Ind. The 18th annual convention, held at St. Cloud, Minn., in 1940, drew 10,000 to the general meetings.

In 1942, the 20th convention, held at Peoria, Ill., was attended by 12 bishops and 500 priests, professors and farm leaders from 42 states. One feature of this particular convention was a joint luncheon held with 60 non-Catholic rural-life leaders and presided over by Bishop Muench of Fargo, N.D.

The 1946 victory convention was held at Green Bay, Wis., from Oct. 11 to 15. Eighteen bishops were in attendance and participated in the pontifical mass celebrated in the Cathedral of St. Francis Xavier. One day of the convention was devoted to farm organizations. Representatives from national offices of the Farm Bureau federation, the National Grange and the Farmers union participated in a panel discussion and addressed the group. First and most important resolution coming out of the Green bay meeting was that favouring the admission of several hundred thousand refugees from eastern Europe, some of them to be settled on the land.

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Catholic Welfare Conference, National

The National Catholic War council, one of seven welfare agencies recognized by the United States government, came into existence during World War I. The wartime experience of the council demonstrated the possibility and desirability of U.S. Catholics co-operating in a nation-wide agency for the advancement of religious and social interests, and after the war the National Catholic Welfare conference was brought into existence. The functions such a body could perform had already been indicated by Pope Benedict XV in the brief "Communes" issued on April 10, 1919. In September of that year the bishops of the United States formally set up the National Catholic Welfare conference.

To evaluate the work of the conference in later years and during the decade 1937-46, it is necessary to recall its nature and organization. The N.C.W.C. was not conceived as a legislative body or a council in the strict canonical sense of the word which makes laws binding all U.S. Catholics. Rather it was to be a conference, approved by the Holy See and incorporated under the laws of the District of Columbia, with the purpose of unifying, coordinating and organizing the Catholic people of the United States in the works of Catholic action, education, social welfare, immigrant aid, relief and similar activities. The bishops themselves, in a joint pastoral letter on the subject, indicated this objective: "We have grouped together under the N.C.W.C., the various agencies by which the cause of religion is furthered. Each of these, continuing its own special work in its chosen field, will now derive additional support through general co-operation."

Every bishop, by reason of his position, was to become a member of the conference. In addition to offering the bishops numerous helpful services it provided them with an opportunity for discussing policies affecting the interests and activities of the church in the United States. Each year, under the auspices of N.C.W.C., the bishops of the country continued to meet together for a week of consultation and discussion. At these meetings, matters of policy were taken up, the annual reports of the various N.C.W.C. departments were presented, officials elected or appointed, and a program of action mapped out for the coming year. The administrative bishops continued to report annually upon the work of the conference to the Holy See.

Over the N.C.W.C. and guiding its policies an administrative board of ten archbishops and bishops was established—elected each year at the annual meeting—with no bishop to serve on the board for more than five consecutive years. The administrative board members elected in 1946 were: Archbishop John T. McNicholas, O.P., of Cincinnati, O., chairman; Archbishop John Gregory Murray of St. Paul, Minn., vice-chairman; Bishop John M. Gannon of Erie, Pa., treasurer; Bishop Michael J. Ready of Columbus, O., secretary; Archbishop Joseph F. Rummel of New Orleans, La.; Archbishop John J. Mitty of San Francisco, Calif.; Archbishop James H. Ryan of Omaha, Neb.; Archbishop Richard J. Cushing of Boston, Mass.; Archbishop Robert E. Lucey of San Antonio, Tex., and Bishop Karl J. Alter of Toledo, O.

The administrative board continued to be assisted by episcopal chairmen or assistant bishops who supervised the work of the various departments of N.C.W.C. In 1946 the administrative board elected the following to so assist: Bishop Richard O. Gerow of Natchez, Miss., in the youth department; Bishop William D. O'Brien, auxiliary of Chicago, Ill., assistant treasurer; Bishop Thomas K. Gorman of Reno, Nev., in the press department; Bishop

Bryan J. McEntegart of Ogdensburg, N.Y., in the legal department; Bishop John P. O'Hara, C.S.C., of Buffalo, N.Y., in the department of Catholic action study; Bishop William S. Scully, coadjutor of Albany, N.Y., in the department of education, and Bishop Emmet M. Walsh of Charleston, S.C., in the department of lay organizations. Mgr. Howard J. Carroll was again named general secretary of N.C.W.C.

During the decade 1937-46, the chairmanship of the administrative board was held for the most part by Archbishop (later Cardinal) Edward Mooney. In 1939, Archbishop Mooney was succeeded for a year by Archbishop (later Cardinal) Samuel A. Stritch. Archbishop Mooney was successively elected to the post in 1940, 1941, 1942, 1943 and 1944. Archbishop Stritch held the chairmanship for the year beginning with the bishops meeting in Nov. 1945. In 1946 Archbishop McNicholas became chairman.

In the years immediately preceding United States entry into World War II, the administrative board of N.C.W.C. showed itself concerned with the trend world affairs were taking. During 1936 a committee of bishops had been instructed to study the problem of Catholic refugees. When they made their report at the November meeting of bishops, the Catholic committee on refugees was organized, to provide assistance for Catholics who because of persecution, racial, political or religious, had become refugees from their homeland. In Jan. 1937, the committee on refugees established its headquarters in New York city. The committee's activities included immigration aid, resettlement, job placement, guidance, relief to refugees. It also performed an interagency function, cooperating with Catholic and non-Catholic organizations engaged in similar work. The committee handled 2,756 cases in 1938 and 1939 and by Sept. 1946, some 7,060 cases had passed through its hands. Once the United States entered the war, the help which could be given refugees was necessarily restricted by shipping difficulties and the military situation. With the refugee problem once more looming large in 1946, the committee laid plans for extending help to those seeking resettlement.

Domestically, actions of N.C.W.C. and of the administrative board reflected conditions in the nation. In 1938 a plea was made for industrial and social peace. The same year a pastoral letter, sponsored by the entire U.S. hierarchy, outlined a program for Christian democratic action. In 1939 the conference celebrated the 20th anniversary of the joint pastoral letter following World War I and outlining a social program for the United States in conformity with Catholic social principles. It was significant that 10 of the 11 principal recommendations made by the bishops in 1919 had been wholly or partially translated into fact by 1939. On Feb. 7, 1940, a new and more comprehensive statement on the church and social order was issued by the administrative board of the conference. It emphasized the need and propriety of more equitable distribution of material wealth and of economic security for all members of the population.

In 1933 a special committee of bishops had been set up to study ways and means of raising the moral standards of motion picture entertainment. In April 1934, the Legion of Decency was formally begun. Catholics were asked to pledge themselves to remain away from objectionable films. In Feb. 1936 the bishops' committee on motion pictures transferred the responsibility for the review and evaluation of films from the various diocesan committees to the archdiocese of New York. The office of the National Legion

of Decency was located in that city. Each week it continued to issue a list of new films according to its judgment of their moral level. The following classifications were used: Class A—section 1: unobjectionable for general patronage; class A—section 2: unobjectionable for adults; class B: objectionable in part; class C: condemned. From Feb. 1936 up to the end of 1945, a total of more than 5,200 feature pictures, shorts and newsreels were classified. The work continued to be carried out by the motion picture department of the International Federation of Catholic Alumnae.

Another project carried out under the direction of a committee of bishops of N.C.W.C. was the systematic campaign in all dioceses of the United States against indecent periodical literature. The committee was originally appointed in Oct. 1939, under the chairmanship of Bishop John F. Noll of Fort Wayne, Ind. The headquarters were set up as the National Office for Decent Literature (N.O.D.L.), located in Fort Wayne. Evaluation of some 150 current periodical publications was carried out through the national office. Local campaigns generally took the form of blacklisting and boycotting objectionable magazines. Particular attention was focused on the problem of keeping obscene publications out of the reach of youth.

Another major development of the decade was the spread of the Confraternity of Christian Doctrine. The national centre of the confraternity was located at N.C.W.C. headquarters in 1934. Its services were used by 110 archdioceses and dioceses of the country at the end of the decade. The confraternity defined its chief function as that of providing for the religious instruction of youth not being educated in Catholic schools. This was done for those of elementary school age by providing special religious vacation schools and Sunday schools, and for those of secondary school age through discussion groups. At the college and university level Newman clubs continued to sponsor programs of religious instruction and discussion.

In 1940 need was seen for establishing a special department of N.C.W.C. to co-ordinate youth activities. The administrative board, at the bishops meeting of 1940, therefore set up a youth department. This department was organized with two types of youth groups in mind. One section was designed to co-ordinate the activities of diocesan youth organizations, already co-operating at the local level through the diocesan youth council. The other section looked after the needs of the National Federation of Catholic College Students and the Newman Club federation, representing youth in Catholic and non-Catholic institutions of higher learning respectively. Functioning under the youth department of N.C.W.C., was the National Catholic Youth council, originally launched as a project of the youth bureau established in 1937 by the administrative board. The youth bureau subsequently became the youth department.

During the years of World War II the activities of the N.C.W.C. were inevitably modified. Although the bishops continued to meet annually, other national meetings were curtailed. Attention of the conference was progressively directed to war-created needs and problems. The education department assisted the colleges in adjusting to wartime programs. It also stressed the need for better inter-American relations on a cultural basis. In Nov. 1941 the administrative board appointed a committee of bishops to study and publicize the peace points of Pope Pius XII. Archbishop Stritch was chairman of this committee.

In Jan. 1942 the bishops' committee on the Pope's peace points issued a statement advocating sincere and honest acceptance of the principle that international law is the basis of a just peace. In 1943 the committee issued a large volume entitled *Principles of Peace*, a compilation of papal pronouncements on the subject. In 1944 it facilitated publication of *A World to Reconstruct*, by Dr. Guido Gonella, translated by T. L. Bouscaren, S.J., dealing with the papal program for peace. Subsequently a digest of this work was published for popular usage.

Prior to Pearl Harbor, the bishops had recognized the need of co-ordinating community services for those in the armed services. In 1940 the National Catholic Community service was set up, as the over-all Catholic agency to be associated with the five similar agencies representing other faiths and groups. All of these agencies were co-ordinated in the United Service Organizations. In its first year of operations, N.C.C.S. set up 113 service centres.

One of the most important works undertaken by the conference during the war years was the printing and distribution of the Acta Apostolicae Sedis, official organ of the Holy See. In many countries, distribution of this documentary service had ceased after Dec. 1940. Under authorization of the Vatican, N.C.W.C. began reprinting it in Sept. 1943. In 1946 there were 1,589 subscribers to this service. Thirty-eight countries benefited.

At the November meeting of the bishops in 1942, a statement was issued declaring that the United States had been forced into the most devastating war of all times and that the conflict of principles made compromise impossible. At the 1944 meeting, a joint letter of sympathy was sent to the bishops of France, expressing concern for the damage done by air raids in French territory. Simultaneously a plea was made for freedom of religion in Poland, the Baltic states and neighbouring lands. After the Dumbarton Oaks conference on international order, the bishops issued a statement calling for peace without reservations or equivocations, according to the principles of the Atlantic charter. They favoured a world court endowed with power to demand execution of its decisions. When the issue of compulsory military training came up in the same year, the bishops expressed the wish that no decision be made until after the war, when a more thorough study of the matter might be made and the men returned from the service would have an opportunity to express themselves. For the time being, they said, extension of the selective service act would suffice.

In Jan. 1943 War Relief Services of N.C.W.C. was established. Its board of trustees comprised the administrative board of N.C.W.C. and the military vicar and military delegates. It administered a program of relief and assistance to refugees, victims of war, prisoners of war and merchant seamen. The administrative offices were located in the Empire State building, New York city. Tragedy visited the offices in July 1945, when an army plane crashed into the building, killing ten and injuring five employees. During the war W.R.S.-N.C.W.C. distributed aid to victims in 40 countries. Drives for food and clothing, as well as cash funds, were conducted.

Another part of the bishops' war program was the War Emergency and Relief committee, established in Nov. 1940. Its membership was identified with the administrative board. During the war, distribution of funds was made mainly through the Holy See, which was able to reach persons who might not otherwise have received assistance. Established Catholic charitable organizations in other countries were also used for distribution of funds. From Nov. 1941 to Dec. 1943, a total of \$2,615,493 was distrib-

uted. In 1944, another \$1,508,522 was distributed for relief.

During the war, the N.C.W.C. press department maintained several correspondents abroad. Two died in action. At the end of 1946, nearly 500 papers were served by the department. These included, besides virtually all Catholic papers in the United States, journals in nearly 40 other countries. Plans revealed in 1946 called for development of foreign news service and increased speed and accuracy in transmitting papal pronouncements. In 1941 Noticias Católicas, the Spanish-American section of the news service, was inaugurated.

In the course of the war years, the family life bureau began a series of conferences on marriage and the family. The papers read at these conferences were subsequently distributed in book form. Postwar plans of the bureau called for further development of these conferences. The first two were held at Catholic university in Washington, D.C. Future conferences were to be held in other cities. Similarly the social action department started conducting conferences on social problems and industrial relations. Held in various cities throughout the United States, these meetings drew hundreds of priests and laymen and were instrumental in propagating Christian principles of social life. The social action department also sponsored a statement on moral principles in economic life which appeared for Labour day, 1946.

Postwar plans called for the development of a Catholic commission on intellectual and cultural affairs, a professional organization dealing with problems of education and culture on a national as well as international level. The commission began its work in close harmony with the education department of N.C.W.C. The director of this department was named a member of the executive board of the National commission to U.N.E.S.C.O.

In 1946 the "Catholic Hour," heard each week over the NBC network, was in its 16th year and was carried on 106 stations. A similar program, the "Hour of Faith," was in its fourth year on the air over the American Broadcasting company network. Both these programs, together with the advisory Catholic Radio bureau, continued to be sponsored by the National Council of Catholic Men.

The National Council of Catholic Women in 1946 embraced 75 diocesan councils, 17 national organizations, seven state organizations and 138 affiliations in dioceses where the council had not yet been established. In addition to continuing its care for the National Catholic School of Social Work, in Washington, D.C., the council devoted itself to relief work and to helping foreign brides of returning servicemen. In Nov. 1946 the administrative board of N.C.W.C. issued a forceful statement on human rights. It called for peace and reconstruction in conformity with the dignity and supernatural destiny of man.

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Catholic Youth Organization

See CATHOLIC ORGANIZATIONS FOR YOUTH.

Catroux, Georges

Catroux (1879-), French army officer, the son of a general, attended the St. Cyr military academy and entered the foreign legion in 1899. He was an aide-de-camp to the governor of Indo-China, served with Marshal (then

Colonel) Louis Lyautey in the Algerian-Moroccan operations in 1911 and was an aide-de-camp to the governorgeneral of Algeria, 1911–14. In World War I, he served with the Algerian *tirailleurs* on the west front. Taken prisoner in 1918, he was released after the armistice.

Following World War I, he became governor general of Damascus. In 1926, he returned to Morocco, during the revolt of the Rif tribesmen, serving as head of army intelligence under Gen. Henri Giraud. Catroux, who became governor general of Indo-China in 1939, was ousted the following year by the Vichy government because of his refusal to permit dispatch of Japanese troops to the colony. He went to England, joined Gen. Charles de Gaulle's Free French movement and was named commander of Free French forces in the near east in 1941. Two years later, he became a member of the French Committee of National Liberation.

In Nov. 1943, Catroux went to Lebanon, where a crisis had been precipitated by the imprisonment of several Lebanese leaders for attempting to alter their constitution without French consent. Catroux, who subsequently charged that British interference was responsible for the disturbed political conditions in the Levant state, restored order by releasing the prisoners, thereby forestalling British military intervention. On Dec. 30, 1944, the French government disclosed that Gen. Catroux had been appointed ambassador to the soviet union.

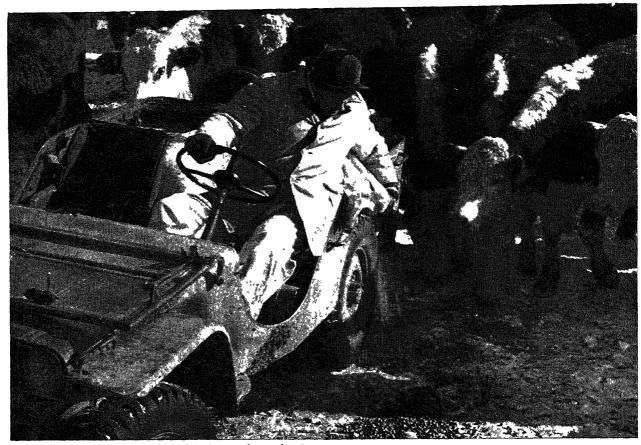
Cattle

World cattle numbers were estimated by the United States department of agriculture at 723,000,000 head, average 1936-40. A comparable estimate for 1944 was 712,200,ooo head. The decline was mostly in Europe, where numbers dropped about 12%. In the U.S.S.R. the decline was 22% and in Asia 6.8%. In the United Kingdom cattle numbers increased because of the emphasis on milk production. Denmark, Sweden and the Netherlands showed only small declines. Cattle losses caused by World War II were heavy in Belgium, France and Italy. In Germany, the cattle numbers were well maintained through the war until 1945, when a loss of 25% was estimated, particularly in eastern Germany. Poland was estimated to have only half the prewar numbers. The drought of 1945 reduced the number of animals in southern Europe, including Spain, Italy, Greece and the Balkans. Switzerland was reported to have increased breeding and to have a largerthan-average number of young stock. The U.S.S.R. replaced some of its losses from former axis countries. South America as a whole increased cattle numbers slightly during the war period. Argentina was reported to have 34,000,000 head in 1945 compared with 33,700,000 in the prewar period.

The number of cattle, including milk cows, increased steadily in the U.S. after 1870 with cycles of gain or loss of eight to ten years' duration. In 1937, a peak of increasing production had been passed; the prospect of war shortened the decline and turned production upward in 1938. From a total of 66,096,000 head in 1937 the increase continued through 1944, with a total of 82,364,000 head, the largest number on record. While the demand for meat was high and slaughter was correspondingly large in 1943-

Number of Cattle in the U.S., 1937-46

							(On Jan	uary 1)						
1937							66,096,000	1942	٠		٠			75,114,000
							65,249,000							79,162,000
1939							66,029,000	1944						82,364,000
1940							68,197,000							81,909,000
1041		_		_	_	_	71.461.000	1946			_	_		79.791.000



U.S. farmer using a jeep as a means of feeding cattle in otherwise inaccessible spots on his farm

44, the very large total was not sharply reduced in 1945 or 1946 but continued at around 80,000,000 head. This total included about 28,000,000 milk cows and 52,000,000 other cattle, principally beef animals.

The increase in cattle in the U.S. was the result of increased feed production, hay and grains, brought about by technical improvements and favourable weather. During World War II grain feeds increased about 30% and hay 18%. Large corn crops were of first importance, amounting to about 73% of the total feed grains. The increase in corn was due largely to the expanding use of hybrid seed. Another important factor in increasing the output of livestock products was the shift to mechanical power on farms.

The decline in feed required for horses and mules on farms and in cities was equivalent to about 50,000,000 acres of crop land and many million acres of pasture. It was estimated that the hay and pasture alone released for cattle feeding would provide for more than 16,000,000 head of cattle and calves.

The slaughter of cattle, including steers, cows and heifers, increased steadily after 1938, and in 1944 the slaughter of cows and heifers exceeded the total number of steers killed. During 1942 breeding herds were being increased and the heifers were kept on the farms. Total slaughter of cattle and calves was reported at 15,254,000 head in 1937 and 20,065,000 head in 1944. A decline began in 1945 and continued through 1946. Both beef and dairy cattle numbers declined.

The total production of U.S. meat per capita increased from an average of 125 lb. per capita in 1935-39 to 177 lb. in 1944. This included pork and mutton, and the sup-

ply of beef was at the high point in 1944. Per capita consumption of beef was estimated at an average of 54.8 lb. in 1935–39, 61.2 lb. in 1942 and 54.5 lb. in 1945. Meat production as a whole increased more than 40% during the war but military, lend-lease and other export demands were so large that civilian supplies increased only 20%. In early 1946, strikes in packing plants delayed slaughter until the government took over and operated the plants in late January. The meat supply was lower than the needs for civilian consumption and export in early 1946, and a smaller number of cattle were in feed lots. Feeder cattle shipped from public stockyards increased from 2,671,000 head in 1937 to 3,179,000 head in 1944 and declined in numbers slightly through 1943 to 1946.

U.S. beef cattle prices for all grades averaged about \$11.47 per cwt. in 1937 and declined slightly in 1939-41, then increased to an average of \$15.44 per cwt. in 1944 and to a top of more than \$18.10 per cwt. in Oct. 1946.

Cattle prices were slightly higher from Jan. to June 1946 than in the same period a year earlier. During the period when price control lapsed in July 1946, beef-cattle prices rose to the record level of \$30.25 per cwt. for a few loads at Chicago, Ill. When price ceilings were restored on Sept. 1, prices declined but reached new records when ceilings were ended in October.

Government subsidies were paid to U.S. livestock slaughterers and producers to hold down the price of meat to consumers and to stimulate production. Slaughter payments were begun in July 1943 and continued through 1945. In early 1945 the Commodity Credit corporation began the payment of 50 cents per cwt. to producers for heavy cattle. Such payments amounted to about \$14,500,000 in 1945 on more than 2,800,000 head of cattle. This

subsidy continued to June 30, 1946. (See also Dairying; Livestock; Meat.)

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Cauliflower

See VEGETABLES.

Cayenne

See Spices.

CCC

See Civilian Conservation Corps; Commodity Credit Corporation.

C.E.D.

See COMMITTEE FOR ECONOMIC DEVELOPMENT.

Celebes Islands

See Netherlands Colonial Empire; Netherlands Indies.

Celery

See VEGETABLES.

Cellulose Products

See CHEMISTRY; PAPER AND PULP INDUSTRY; PLASTICS INDUSTRY; RAYON AND OTHER SYNTHETIC FIBRES.

Cement

World data on the production of cement were so fragmentary during World War II that it was difficult to secure an approximation of the total. In 1939, the world total was about 103,000,000 short tons or 513,000,000 bbl., declining to 80,000,000 tons or 400,000,000 bbl. in 1942. Prewar producers of amounts in excess of 1,000,000 tons annually, in decreasing order of magnitudes, were the United States, Germany, Great Britain, Japan, U.S.S.R., France, Italy, Belgium, Czechoslovakia, Poland, Argentina, India, Sweden, Canada and South Africa. In 1937, these countries accounted for 85% of the total output, and 50 others for the remainder.

While world cement production declined appreciably after 1939, production in the United States was increased by the construction demands for the war program, reaching a maximum in 1942. The salient features of the industry in the United States are shown in the accompanying table.

In 1944, U.S. production dropped to its lowest level since 1936, but with the close of the war a revival of building brought renewed activity. While the 1945 output was only 13% over that of 1944, by Aug. 1946 production had jumped to 16,213,000 bbl., a rate 6% higher than the monthly average in 1942, the peak year of war demand. U.S. shipments were even higher; the August rate of 17,-

955,000 bbl. was 15% above the 1942 average, and stocks had been pulled down from 20,000,000 bbl. to 9,300,000 after February.

The cement industry in Canada followed much the same course as that in the United States. Sales were 6,168,971 bbl. in 1937, declining to 5,519,102 bbl. in 1938, with recovery to 5,371,264 bbl. in 1939; war demand brought the figure to 9,126,041 bbl. in 1942, declining to 7,190,851 bbl. in 1944, while postwar building raised it to 8,378,341 bbl. in 1945 and 6,538,063 bbl. in the first seven months of 1946, a rate equivalent to 11,200,000 bbl. for the year. (See also GYPSUM.)

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Censorship

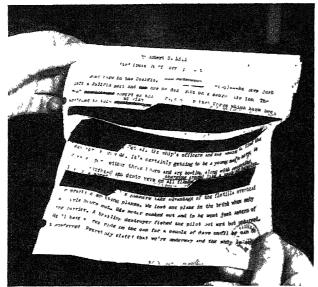
Censorship in the United States during World War II was the most comprehensive in the nation's history, but it did not approach in severity the restrictions upon free expression which were in effect in many other countries. Communications entering or leaving American soil, by whatever means, were carefully scrutinized and passed, deleted, delayed or suppressed. In the domestic field the press and radio were brought under a voluntary program restricting the publication or broadcast of many classes of information. In all its aspects, however, the censorship dealt only with war security. No attempt was made to suppress opinion or criticism of the government. As a result, censorship concluded its operations amid general praise both from the public and from the military, and even the most zealous guardians of civil liberty appeared satisfied.

For the first time, all censorship authority (except that exercised by the military over its own personnel and war correspondents abroad) was centred in a single individual, the director of censorship. He had under him a staff which at the peak of its activities numbered in excess of 14,000, stationed in Washington, D.C., and at strategic points around the perimeter of the country. The agency which the director headed was known officially as the U.S. Office of Censorship. It was an independent civilian agency responsible only to the president. It came into existence Dec. 19, 1941, 12 days after the attack on Pearl Harbor. It ceased all censorship operations on Aug. 15, 1945, a few hours after the surrender of Japan, and had completed liquidation and passed completely out of existence on Nov. 15, 1945.

The agency had two types of responsibility. It withheld from the axis information which might be of value to it, and it collected information which would be of value to the U.S. in its prosecution of the war. The great bulk of its personnel and expenditures had to do with the censorship of international communications, in which operation it handled daily about 1,000,000 pieces of mail, and

some 50,000 cables, radiograms, telegrams across the border and international telephone calls, besides numerous other instruments, such as papers carried by travellers. It was entirely from the physical interception of such international communications that the Office of Censorship was enabled to turn over to

Data of the Cement Industry in the United States													
(Thousands of barrels)													
ŧ	1937	1938	1939	1940	1941	1942	1943	1944	1945				
Production, total Portland cement Other varieties	118,075 116,175 1,901	107,778 105,357 1,821	124,698 122,259 2,439	132,751 130,217 2,535	166,907 164,031 2,876	185,342 182,781 2,560	135,254 133,424 1,830	92,1 <i>5</i> 2 90,906 1,247	104,289 102,805 1,484				
Shipments, total	115,678 113,805 1,873	108,192 106,324 1,868	125,057 122,651 2,405	132,864 130,350 2,515	170,365 167,439 2,926	187,809 185,301 2,508	129,479 127,632 1,847	95,592 94,272 1,320	107,833 106,354 1,480				
Stocks Portland cement	24,913 6,342 254	23,993 5,286 374	23,646 5,165 240	23,365 4,889 260	19,965 4,575 199	17,380 3,509 253	23,189 5,959 237	19,953 5,329 167	16,404 4,460 171				
Imports	1,804 379 11 <i>7</i> ,104	1,727 558 109,361	1,914 1,146 125,824	538 1,668 131,735	43 2,556 167,853	1,101 1,109 186,709	1.732 1,732 127,760	4,040 91,552	6,476 101,357				



A slashed news dispatch of 1942 from the Solomon Islands, after it had passed through U.S. naval censorship

other war agencies a tremendous mass of information relating to such subjects as the operation of spies and attempts to circumvent wartime financial regulations and conceal or export strategic material illegally.

The voluntary domestic censorship of press and radio paid no similar tangible dividends of intelligence but was entirely on the side of repression. A similar voluntary operation had been undertaken in previous wars, but never on so broad a scale. Not only newspapers and broadcasting were asked to co-operate, but detailed attention was given also to magazines, books, house organs, church and school publications, private radio-telegraph systems and police, highway and other governmental radio.

Prior to the outbreak of the war, all planning for censorship had been in the hands of the army and navy. The army made plans for censorship of mails and trained a number of reserve officers in postal censorship techniques. The navy devoted its planning to the field of electrical communications and operated similarly a training school for naval reserve officers. A recommendation by a joint army-navy board that plans also be made by the services for the censorship of press and broadcasting was rejected by Press. Roosevelt.

The navy's preparations advanced far more rapidly than did those of the army. Beginning in Sept. 1939 the navy undertook to build an actual organization. It called a considerable number of reserve officers to active duty and stationed them as a skeleton staff at various cableheads. As a result, censorship of the cables actually began without specific legal sanction within a matter of a few hours after the first bombs fell on Pearl Harbor.

It was not until late in 1940 that the army began similar intensive planning and training in the field of postal censorship. Nevertheless, all of the postal censorship stations which had been planned were opening letters on a small scale by midnight of Dec. 13, 1941.

Censorship was first buttressed with legal sanction on Dec. 18, 1941, with enactment of the First War Powers act, section 303 of which authorized the president to cause all communications entering and leaving the country to be censored. A penalty of \$10,000 fine and ten years imprisonment was provided for wilful attempts to evade such censorship. On Dec. 19 the president signed an executive order creating an Office of Censorship, appointing a direc-

tor of censorship, and authorizing the director to censor international communications in "his absolute discretion." Neither the First War Powers act nor the executive order of Dec. 19 mentioned censorship of the domestic press or of broadcasting. Separately, however, the president wrote the director asking him to supervise a system of voluntary co-operation.

In general, these steps re-established the functions exercised by censorship during World War I, although the machinery for exercising those functions was quite different. In World War I, final censorship authority over international communications was vested in a committee representing the army and navy and other government agencies, while voluntary censorship of the press was under the supervision of a separate Committee on Public Information. Furthermore, the Committee on Public Information also supervised the handling of government information and propaganda, a duty which in World War II was no part of censorship but became the responsibility of the Office of War Information. The latter agency had no connection whatever with the Office of Censorship. The new arrangement had the great advantage of centralizing in a single person all decisions relating to censorship but at the same time keeping the censors free from entanglement in fields other than censorship.

To the post of director of censorship the president appointed on Dec. 19, 1941, Byron Price, a newspaperman who had served in Washington more than 20 years and subsequently was executive news editor and acting general manager of the Associated Press. The appointment was completely nonpartisan, the new director never having been a member of any political party or faction. Announcing the appointment, Pres. Roosevelt outlined the bases of the censorship as follows:

"All Americans abhor censorship, just as they abhor war. But the experience of this and of all other nations has demonstrated that some degree of censorship is essential in war time, and we are at war.

"It is necessary to the national security that military information which might be of aid to the enemy be scrupulously withheld at the source.

"It is necessary that a watch be set upon our borders, so that no such information may reach the enemy, inadvertently or otherwise, through the medium of the mails, radio or cable transmission, or by any other means.

"It is necessary that prohibitions against the domestic publication of some types of information, contained in long-existing statutes, be rigidly enforced.

"Finally, the government has called upon a patriotic press and radio to abstain voluntarily from the dissemination of detailed information of certain kinds, such as reports of the movement of vessels and troops. The response has indicated a universal desire to cooperate."

The largest single task confronting the new agency was censorship of international mail, conducted by a Postal division of the Office of Censorship which at its peak had more than 10,000 employees, including some 2,000 who read letters to and from prisoners of war. Postal censorship was carried forward by Major (later Brigadier General) W. Preston Corderman, U.S. army, who had been in charge of war department planning. He was appointed an assistant director of censorship. A year later, when he was recalled by the army, he was succeeded by Lieut. Col. (later Col.) Norman V. Carlson. Also appointed an assistant director in charge of the censorship of all international communications by electrical means was Capt. H. K. Fenn, U.S. navy, who had been in charge of navy department planning. He continued as the head of the Cable division

throughout the war. These officers and all others who served in the Office of Censorship, although a part of the military establishment, were responsible in their censorship duties only to the director of censorship.

While the Postal and Cable divisions were completing their organization, the director appointed John H. Sorrells, executive editor of the Scripps-Howard newspapers, as assistant director in charge of the Press division, and J. Harold Ryan, general manager of the Fort Industries which operated six radio stations in the south and middle west, as assistant director in charge of the Broadcasting division. Both of these new assistant directors were installed by Jan. 1, 1942. Sorrells some months later was promoted to deputy director, second in command of the entire Office of Censorship. He was succeeded by Nat R. Howard, editor of the Cleveland News, who in turn was succeeded by Jack H. Lockhart, managing editor of the Memphis Commercial-Appeal. Lockhart also returned to newspaper work May 1, 1945, and was replaced by Theodore F. Koop of the National Geographic magazine, who had been from the beginning personal assistant to the director.

So that the public would know specifically what was required, the Office of Censorship published early in 1942 a set of regulations for censorship of mail and cables, and a Code of Wartime Practices for press and radio. Some 300 categories of information having to do with such subjects as shipping, planes, troops, fortifications, war production, armaments and weather were listed as a guide to what could not be mentioned in international mail or messages and ought not to be mentioned in domestic publication or broadcast. In case of doubt, editors and broadcasters were requested to consult the Office of Censorship.

With a few exceptions the code was identical for press and broadcasting. One exception was the weather. The press was asked to print only limited official forecasts while radio, because of the possibility of instantaneous reception by the axis, was asked to omit all reference to the weather entirely. It also was asked that certain types of radio programs in which the public participated in such a way that an axis agent might gain control of the microphone and send a code message, be discontinued for the duration. The response of press and radio was instantaneous and uniformly excellent.

As the agency developed, two other divisions were added. The Reports division was given the responsibility of screening and disseminating to interested war agencies valuable

Photographed in 1941 by special permission of the U.S.A.A.F., this picture shows a row of Lockheed Hudson bombers earmarked for Great Britain. Guard at the left was a member of the Lockheed police force



information intercepted in the mails and cables. All such information was passed along under the most rigid secrecy on special forms carrying in each instance the following notice:

"The attached information was taken from private communications, and its extremely confidential character must be preserved. The information must be confided only to those officials whose knowledge of it is necessary to the prosecution of the war. In no case should it be widely distributed, or copies made, or the information used in legal proceedings or in any other public way without express consent of the Director of Censorship."

As the head of the Reports division, the director appointed A. D. Durford, a career official in the bureau of internal revenue. He was succeeded after some months by Harold Keats, a retired lawyer and businessman.

The Technical Operations division was added in Aug. 1943, to devote its entire attention to counterespionage, which formerly had been handled piecemeal in various other divisions. The Technical Operations division established its own laboratories for the detection of secret inks and other means of attempted evasion of censorship. This division was headed by Lieut. Col. (later Col.) Harold R. Shaw. It established the closest relations with the technical experts of other Allied censorships and worked also in the closest liaison with such agencies as army and navy intelligence, the Federal Bureau of Investigation, and the Office of Strategic Services. The Office of Scientific Research and Development also rendered notable assistance, conducting exhaustive experiments and devising in secret some entirely new laboratory techniques, of particular value in the examination of suspected pieces of mail.

Holding to its cardinal principle that "What does not concern the war does not concern Censorship," the office rigidly refused the requests of various other agencies that it report information on circumvention of tax and other peacetime laws and suppress news for policy reasons. The result was that censorship's contribution was entirely to national security, and not to politics or public morale or any other extraneous part of the U.S. scene. That contribution was, of course, immeasurable, since it would be impossible to set a value on the preservation of American life and individual liberties. Thousands of pieces of information which unquestionably would have helped the axis in one degree or another were kept out of the press and off the air, and were deleted from international communications.

Although thousands of persons were engaged in the manufacture of the atomic bomb, and hundreds of newspaper and radio reporters knew in a general way what experiments were in progress, use of the bomb over Hiroshima came as a complete surprise to the Japanese. The landing in North Africa and the time and place of the later landing in Normandy, the conferences between the president and the war leaders of other countries at Casablanca and elsewhere and a host of other developments of the highest importance likewise were successfully blacked out until the proper time. To the very end Japan was kept guessing about the results of its balloon invasion of western U.S., and the lack of reports probably led the Japanese to conclude that the balloons were not arriving at all.

Although these accomplishments on the side of defense were important, they were overshadowed in the view of many responsible officials by the more affirmative and tangible achievements on the offensive side of warfare. Never before had censorship been used so intensively or

so successfully as a weapon of offense. A considerable number of spies were apprehended as the result of the discoveries and investigations of the Postal, Cable and Technical Operations divisions. Not so dramatic but no less important were censorship's activities in the economic field. Hundreds of pieces of economic intelligence were turned over daily to the Foreign Economic administration, the War Production board, and other agencies having to do with wartime financial and commercial controls. Previously unreported stockpiles of strategic materials were uncovered, not only in the U.S. but in many other parts of the world. Literally hundreds of efforts to export goods and funds illegally were uncovered and stopped.

Axis interest in many firms, particularly in Latin America, was disclosed, and the movement of axis funds throughout the world was paralyzed by the globe-circling censorship network which the Allies were eventually able to perfect, and of which U.S. censorship was a highly important part. The naval blockade would have been far weaker except for the flow of information constantly provided to the naval authorities by censorship.

Complete co-operation with the censorships of Great Britain, Canada, France and various other countries, including those of Latin America, was a prime objective. Intercepted information was exchanged freely, and a constant liaison was maintained for the exchange also of technical censorship information. Co-operation with the British was particularly close, since the two censorships were seeking a common end, and were not interested, as were some other national censorships, in collecting intelligence not directly related to the war. Eventually the British and U.S. censors found themselves operating under almost identical regulations.

As the Office of Censorship gained experience, it was possible to exercise a much greater selectivity of censorable material and so to effect economies. The growth of foreign co-operation also simplified the task, as did the additional fact that the progress of military operations and the defeat of the German submarine isolated the axis more and more definitely from communication with the outside world and thus rendered some of the more rigid restrictions no longer necessary. Even before the collapse of Germany, a number of the smaller censorship stations throughout the country and abroad were closed, communications between the mainland and the outlying territories were freed of censorship, and various administrative consolidations were effected. Still further economies were accomplished after the German defeat. These retrenchment policies were enforced through the constant effort of Robert L. McKeever, a Washington real estate dealer, who served as administrative assistant in charge of budget and personnel.

During the first months of its operation, the agency was financed by a \$7,500,000 allocation from the emergency fund of the president. Subsequent congressional appropriations were as follows: For the fiscal year 1943, \$26,500,000; for the fiscal year 1944, \$29,600,000; for the fiscal year 1945, \$29,700,000; and for the fiscal year 1946, \$13,000,000. During its existence the agency actually spent about \$16,500,000 less than its total appropriations. About half of this saving was caused by the fact that operations ceased early in the fiscal year 1946.

Although in general the Office of Censorship was a target of less criticism than most war agencies, it underwent congressional investigation on two occasions. Late in 1942. Gov. Ernest Gruening of Alaska made a public pro-

test against censorship of mail between Alaska and continental U.S. Several hearings were held by the Senate Judiciary committee. Atty. Gen. Biddle, Director Price and representatives of military intelligence, naval intelligence, and the Federal Bureau of Investigation, went before the committee with evidence not only of the legality of this censorship, but of the important intelligence it was producing. The investigation was allowed to die and the censorship continued. In 1944, in spite of the stringent precautions which surrounded the distribution of information taken from private mail, some letters between a woman manufacturer in Connecticut and a German count in Argentina were published in the newspapers. The senate established a special investigating committee and extensive hearings were held, but the source of the information never was established and the committee discontinued its sessions and made no report.

Following to the last its conviction that censorship was permissible in a democracy only as a war measure, the Office of Censorship had ready early in 1945, detailed plans for its own liquidation. When the surrender of Japan was announced on the night of Aug. 14, 1945, the director asked Pres. Truman for authority to cease all censorship operations and to give 30 days notice to all employees except for a small group needed for liquidating the agency. The president gave his approval, and on the afternoon of Aug. 15, censorship came to an end. Thirty days later 95% of the staff were off the government pay roll, and 90 days later, on Nov. 15, the agency was finally abolished, having liquidated all of its property, personnel, contracts and records. Its secret files containing watch lists, case histories, and excerpts from letters and messages were reduced to microfilm and deposited in the national archives under a seal which could be broken only on the order of the president.

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(B. PR.)

British Censorship.—With the outbreak of World War II, an organization was established, almost unnoticed, at all ports under Allied control, for the censorship of overseas correspondence. It operated as a branch of the security services, and its object was as much to obtain intelligence from axis communications as to prevent information of value reaching the axis.

The censorship of the press presented a more difficult problem. A free press was still one of the liberties to which the British people remained strongly attached, yet there was no surer nor speedier way of giving information to the axis than by means of an uncensored press. Parliament therefore decided on a voluntary system of censorship for United Kingdom press, periodicals, books and films, but permission to take photographs of war interest was made dependent on submission to censorship prior to publication. Apart from this obligation, editors and publishers were under no compulsion to submit material before it was published, nor even to abide by the censor's deletions in material which had been submitted. Like the ordinary citizen, however, they could be prosecuted under defense regulation three, for communicating to any other person, or publishing, information which might be useful to the axis, unless official sanction had been given to do so. A pamphlet entitled The Defence Notices was therefore produced to assist them. It contained a list of subjects on which editors were asked not to publish information without prior censorship advice. Material thus submitted was censored by a special department of the ministry of information called the press censorship. Experience soon proved, however, that *The Defence Notices* were too comprehensive and went beyond the limits of military security, on which ground alone the censors had authority to give advice. Early in 1940, the pamphlet was revised in consultation with representatives of the press. From then onward the press censorship was operated on a truly voluntary basis, the subjects for submission having been agreed upon both by the government departments concerned and the press, and rapidly gained the confidence and co-operation of the press. Late in 1941 regional press censorship units were set up in seven provincial towns to enable provincial newspapers to submit their material locally.

The censorship of all material leaving the United Kingdom, whether by telegram, telephone, wireless or mail, and intended for publication in the press overseas, was made compulsory and was also a press censorship responsibility. Voluntary censorship in this case was neither practicable nor considered safe since a message once dispatched passed out of control. Apart, however, from a period of two years beginning March 1942, when outgoing messages were subject to a limited degree of political censorship, material for the overseas press and for the home press was censored on similar lines.

British Broadcasting corporation broadcasts were treated as home press material and were censored under the supervision of the press censorship by censors at Broadcasting house.

War correspondents' dispatches were dealt with by military censors at general headquarters in the area of operations. These censors were trained initially at the press censorship and operated in general in accordance with its principles. (See also Civil Liberties; Newspapers and Magazines; Popular Culture; Radio.) (G. P. T.)

Census Data, U.S.

The 1940 census of population in the United States covered a decidedly wider field than any earlier census. The expansion brought in many new topics, including extensive data on housing, derived from a separate housing schedule; data on migration between 1935 and 1940; an elaborate classification of the labour force by employment status, hours worked, income, etc.; and data on families and fertility-these last mainly from a 5% sample tabulation. Innovations in the way of geographic areas included selected housing data by city blocks; many tabulations for metropolitan districts (providing information formerly available only for the central cities); population and housing data for census tracts (permanent statistical subdivisions) in 60 cities, and much additional data for counties, townships and the smaller incorporated places. The 1940 statistics presented herewith consist mainly of national totals, which present the over-all picture in each field and are also suggestive of data to be found for states, cities, counties and smaller areas in the voluminous reports of the 16th decennial census.

A considerable part of the later data, that is, of the figures for dates subsequent to 1940, is based on a monthly survey of a sample of 25,000 or 30,000 representative households scattered throughout the United States, made primarily as a basis for the monthly report on the labour force and, by reason of the relatively small size of the sample, subject to a larger degree of sampling variation than the sample-based figures of the 1940 census. With respect to even these figures, however, it may be said in general that the totals and the larger subtotals in a given table are subject to a fairly small error from this source, though the smaller and more detailed subtotals are sub-

ject to a possibility of error which increases with the decrease in the size of the figures in question.

Growth of Total U.S. Population.—The population of continental United States on April 1, 1940, the date of the 16th census, was 131,669,275, as compared with 122,775,046 on April 1, 1930, the date of the 15th census. The increase during the decade ending in 1940 thus amounted to 8,894,229 persons. While this is a considerable number, it represented a gain of only 7.2%, the smallest relative increase ever recorded in United States census history.

In 1790, when the first census was taken, the population was just short of 4,000,000. Each subsequent decennial census up to 1860 showed an increase of about one-third over the preceding census; from 1860 to 1910 the decennial increase was around 20% or 25%; for the next two census decades the figures were 14.9% and 16.1% respectively; and in the period from 1930 to 1940 the increase, as indicated above, was only 7.2%, or less than half the smallest previous increase. The data for the 16 censuses, including area as well as population, are given in Table I.

Table I.—Population and Area of Continental United States, 1790 to 1940

				increase		Popula-	
				preceding	census	Land area	tion
Census date			Population		Per	ın sq.mi.	per
				Number	cent		sq.mi.
1790 (Aug. 2)			3,929,214			867,980	4.5
1800 (Aug. 4)			5,308,483	1,379,269	35.1	867,980	6.1
1810 (Aug. 6)			7,239,881	1,931,398	36.4	1,685,865	4.3
1820 (Aug. 7)			9,638,453	2,398,572	33.1	1,753,588	5.5
1830 (June 1)			12,866,020	3,227,567	33.5	1,753,588	7.3
1840 (June 1)			17,069,453	4,203,433	32.7	1,753,588	9.7
1850 (June 1)		٠	23,191,876	6,122,423	35.9	2,944,337	7.9
1860 (June 1)			31,443,321	8,251,445	35.6	2,973,965	10.6
1870 (June 1)			*39,818,449	8,375,128	26.6	2,973,965	13.4
1880 (June 1)			50,155,783	10,337,334	26.0	2,973,965	16.9
1890 (June 1)			62,947,714	12,791,931	25.5	2,973,965	21.2
1900 (June 1)			75,994,575	13,046,861	20.7	2,974,159	25.6
1910 (April 15) .			91,972,266	15,977,691	21.0	2,973,890	30.9
1920 (Jan. 1)			105,710,620	13,738,354	14.9	2,973,776	35.5
1930 (April 1)			122,775,046	17,064,426	16.1	2,977,128	41.2
1940 (April 1)			131,669,275	8,894,229	7.2	2,977,128	44 2

*Revised flaure.

The land area of the United States in 1790 was only 867,980 sq.mi., or less than one-third of the 1940 figure, and the population density only 4.5 persons per sq.mi. The major additions were the Louisiana purchase of 1803; Florida, acquired in 1819; and three areas, the Oregon territory, the Mexican cessions and Texas, added between 1840 and 1850. With these last the country reached approximately its land area of 2,977,128 sq.mi., but much of this territory was so thinly settled in 1850 that the average population per square mile for the country as a whole was only 7.9. This average increased gradually with the increase in total population until in 1940 it stood at 44.2 persons per square mile of land area.

Month-to-month estimates for the population of the United States as a whole after 1940 were made on the basis of current records of births and deaths (adjusted for underregistration) and net immigration—the latter including the excess of arrivals over departures of citizens as well as aliens, and including movement between continental United States and the territories and possessions, as well as movement of population from or to foreign countries. The estimates for July 1 of each year are presented in Table II, together with similar estimates for the years 1937 to 1939, and an estimate for Jan. 1, 1946. These estimates represent the de jure population, including for 1942 and later years persons in military service overseas. The table also shows the annual increase and indicates what part of this increase was the result of the excess of births over deaths and what part resulted from the excess of immigration over emigration. (The estimates are pre-

sented to the last digit as computed instead of being rounded, not because they are assumed to be accurate to the last digit, but for convenience in summation.)

The population of continental United States on July 1, 1945, according to these estimates, was 139,-621,431, representing an increase of 1,537,982 over the population estimated for

July 1, 1944. The sources of this increase may be analyzed as follows. There were, during the year ending June 30, 1945, 2,970,284 births, from which may be subtracted 1,631,215 deaths, leaving a natural increase of 1,339,069, representing the major part of the population increase. The remainder was made up of net civilian immigration amounting to 198,913, including more than 15,000 persons coming into continental United States from the territories and possessions. The rate of increase for the year ending June 30, 1945, was 1.1%, which was slightly less than the rate of increase attained in some of the years just preceding, but much higher than the average annual rate of 0.7% for the decade 1930-40.

The estimated population on Jan. 1, 1946, was 140,386,-509, representing an increase during the 6-month period of approximately half that of the preceding year, though the contribution from net immigration was only 45,965, or less than one-fourth of the preceding annual figure.

The later acceleration in the rate of population growth resulted mainly from a very considerable increase in the annual number of births. During the year ending June 30, 1943, in which the birth rate reached its maximum, there were 3,209,177 births, as compared with 2,558,000 in the calendar year 1940 and an annual average of about 2,400,000 for the decade between 1930 and 1940. In the year ending June 30, 1944, the number of births had fallen to 3,016,562, and in the next year it was slightly less, namely, 2,970,284, though in either year it was still higher by about 600,000 than the prewar average.

The birth rate had declined steadily, and at times rather rapidly, from 1921 to 1936, with a slight increase between that date and 1940. The marked increase after 1940 may be attributed, first, to the business prosperity brought about by defense activities and then to the anticipation of conscription and of the actual entry of the United States into World War II. The number of deaths during these years, however, increased only slightly, even with war casualities included, amounting in the year ending June 30, 1945, to only 1,631,215, or less than 200,000 above the figure recorded for 1941.

While it was difficult to make valid assumptions with respect to the trend of population growth in future years under the unsettled conditions characterized by the ups and downs in the birth rate and especially in the marriage rate, there was so much demand for some indication of the future prospects with respect to the growth of population in the United States that an elaborate series of population forecasts was worked out. A summary of the total population indicated by these forecasts is presented in Table III for decennial dates up to the year 2000. The predicted increase of 10.5% in the population during the decade ending in 1950 represented an annual average for the decade only slightly less than the annual rate prevailing in the mid-decade year 1945, but a rather rapid decline in the rate of increase was forecast for succeeding

(Estimates from 1942 to 1945 include armed forces overseas)

		preceding			Analysis of increase			
Date	Population	Number	Per cent	Births*	Deaths*	Excess of births	Net civilian immigration	
July 1, 1937	128,824,829 129,824,939 130,879,718 131,970,224 133,202,873 134,664,924 136,497,049 138,083,449 139,621,431	1,000,110 1,054,779 1,090,506 1,232,649 1,462,051 1,832,125 1,586,400 1,537,982	0.8 0.8 0.8 0.9 1.1 1.4 1.2	2,369,615 2,390,412 2,438,680 2,628,113 2,808,000 3,209,177 3,016,562 2,970,284	1,412,249 1,432,794 1,425,297 1,454,088 1,415,194 1,487,068 1,556,377 1,631,215	957,366 957,618 1,013,383 1,174,025 1,392,806 1,722,109 1,460,185 1,339,069	42,744 97,161 77,123 58,624 69,245 110,016 126,215 198,913	
July 1, 1941 July 1, 1942 July 1, 1943 July 1, 1944	133,202,873 134,664,924 136,497,049 138,083,449	1,232,649 1,462,051 1,832,125 1,586,400	0.9 1.1 1.4 1.2	2,628,113 2,808,000 3,209,177 3,016,562	1,415,194 1,487,068 1,556,377	1,392,806 1,722,109 1,460,185	69,2 110,0 126,2	

*Estimated total, including an adjustment for under-registration. †A provisional figure for July 1, 1946, is 141,175,000.

decades, until the population would reach a maximum just short of 165,000,000 in 1990 and then start a slow

Table III.—Forecasts of the Total Population of Continental United States 1950 to 2000

(Based on the assumption of medium trends in fertility and mortality and no net immigration after 1945. A minus sign (—) denotes decrease)

Increase over

			preceding of	
Date		Population	Number	Per cent
April 1, 1940 (census)	 	131,669,275	_	_
July 1, 1950		145,460,000	13,790,725	10.5
July 1, 1960	 	153,375,000	7,915,000	5.4
July 1, 1970	 	1 <i>5</i> 9,847,000	6,472,000	4.2
July 1, 1980	 <i>.</i>	163,877,000	4,030,000	2.5
July 1, 1990	 	164,585,000	708,000	0.4
July 1, 2000	 	163,312,000	-1,2 73 ,000	-0.8

The population estimates discussed above represent what has been termed the de jure population of the United States, including persons in the armed forces overseas, this being the type of estimate most closely comparable with the actual census figures of earlier years. Two other types of estimates were made, however—an estimate of the civilian population, excluding all persons in the armed forces (United States total for 1945, 127,409,297) and an estimate of the population excluding persons in the armed forces overseas but including those stationed in the several states (United States total for 1945, 131,975,-774), which last was sometimes referred to as the de facto population. While it was possible to make fairly accurate estimates of the total population of the United States on each one of these three bases, similar estimates could not readily be made for individual states or regions because of the fact that there were no satisfactory data on interstate migration. In response to insistent demand, however, estimates of the population distributed by states were made in accordance with the two definitions just mentioned. The best information available as a basis for the distribution of population data by states was a series of estimates of the civilian population in Nov. 1943, based on the registration for the last of the war ration books. Estimates for 1945 were made on the assumption that the interstate migration indicated by the 1943 estimates had continued at a decreasing rate for the period from 1943 to 1945. These estimates, for the civilian population, which would seem to be on the whole the more useful of the two series of state estimates, are presented in Table IV, together with an additional column representing the net loss of each state to the armed forces during the period ending July 1, 1945. This last column represents approximately the difference between the civilian population and the total population including persons in the armed forces overseas. This figure may be considered in connection with the increase or decrease in civilian population in a specific state to give some approximation of the change in total population-that is, the change which would appear if all of the men in the armed services were to return to the state of their preservice residence. The

Table IV.—Civilian Population, 1945 and 1940, with Estimated Net Loss to Armed Forces, by States

state of Maine, for example, showed a loss in civilian population between 1940 and 1945 amounting to 72,560, but this figure was slightly less than the number of persons who went into the armed forces from the state of Maine. The state of Illinois showed a loss in civilian population of 339,-218, but this loss was only somewhat less than half the contribution of that state to the armed forces, so that if all of its citizens in military service had returned the state would have shown a considerable increase in population. In those states, on the other hand, where even the civilian population showed a substantial increase, the addition of the numbers contributed to the armed forces would have made the increase still more substantial.

The total civilian population of the United States was 3% smaller in 1945 than in 1940, so that any state showing a decrease less than 3% may be considered to have had a relative gain. The absolute gains in civilian population up to 1945 were largely concentrated in a few western states, especially in California, with substantial increases shown also for the District of Columbia, Maryland, Florida and Virginia. Most of the increases represented migration to war production centres, and the largest de-

creases are shown for states in which there was little or no activity of this kind.

Apportionment.-The law under which the representation of the various states in the house of representatives is reapportioned on the basis of each succeeding decennial census was amended by an act of congress approved Nov. 15, 1941, to the effect that all reapportionments are to be made by the method of equal proportions, this being one of two alternative methods permitted under the law as it previously stood (the other method being that of major fractions). Under the method of equal proportions, after each state is assured of one representative, the additional representatives are so assigned that the average population per representative shows the least possible variation as between one state and another, both on an absolute and on a percentage basis; and the average number of representatives per 1,000,000 of the population shows likewise the least possible difference on a percentage basis.

		Estimated civilian	population		Estimated
	July 1,	April 1, 1940	Increase decreas	e (—)	net loss to armed forces
Region, division, and state UNITED STATES	1945 127,409,297 71,862,525 40,264,869 15,281,903	(census) 131,401,985 76,057,745 41,519,845 13,824,395	Number -3,992,688 -4,195,220 -1,254,976 +1,457,508	Per cent -3.0 -5.5 -3.0 +10.5	1940-45* 12,228,109 7,134,229 3,663,604 1,430,276
THE NORTH	, ,	• • • • •		•	•
New England- Maine	772,621	845,181	-72,560	-8.6	75,773
	445,930	490,638	-44,708	-9.1	46,251
	310,211	358,856	-48,645	-13.6	26,605
	4,086,197	4,313,838	-227,641	-5.3	415,358
	698,903	707,920	-9,017	-1.3	71,674
	1,768,602	1,706,886	+61,716	+3.6	171,354
Middle Atlantic: New York New Jersey Pennsylvania	12,343,450	13,462,641	-1,119,191	-8.3	1,287,871
	4,104,176	4,156,642	-52,466	-1.3	424,241
	9,142,797	9,895,937	-753,140	-7.6	1,033,415
THE SOUTH					
East North Central Ohio Indiana Illinois Michigan Wisconsin	6,823,137	6,905,092	-81,955	-1.2	672,356
	3,387,463	3,427,394	-39,931	-1.2	304,583
	7,548,109	7,887,327	-339,218	-4.3	738,523
	5,435,092	5,252,922	+182,170	+3.5	492,490
	2,934,044	3,137,189	-203,145	-6.5	247,291
West North Central: Minnesora lowa Missouri North Dakota South Dakota Nebraska Kansas	2,484,993	2,791,933	-306,940	-11.0	242,005
	2,236,203	2,537,605	-301,402	-11.9	195,330
	3,481,949	3,783,760	-301,811	-8.0	322,784
	519,709	641,875	-122,166	-19.0	49,707
	526,607	642,866	-116,259	-18.1	49,818
	1,155,744	1,314,255	-158,511	-12.1	106,551
	1,656,588	1,796,988	-140,400	-7.8	160,249
South Atlantic: Delaware Maryland Dist. of Columbia Virginia West Virginia North Carolina South Carolina Georgia Florida	277,455	266,128	+11,327	+4.3	24,713
	2,017,971	1,813,132	+204,839	+11.3	182,487
	836,900	654,513	+182,387	+27.9	77,220
	2,810,278	2,649,949	+160,329	+6.1	244,287
	1,716,944	1,901,919	-184,975	-9.7	184,647
	3,333,999	3,566,206	-232,207	-6.5	292,614
	1,797,583	1,886,013	-88,430	-4.7	150,744
	3,002,899	3,099,527	-96,631	-3.1	238,620
	2,059,505	1,890,919	+168,586	+8.9	182,439
Kentucky	2,520,537	2,840,944	-320,407	-11.3	230,708
	2,832,480	2,915,536	-83,056	-2.8	258,668
	2,728,120	2,821,651	-93,531	-3.3	240,416
	1,990,073	2,183,405	-193,332	-8.9	176,266
West South Central: Arkansas Louisiana Oklahoma Texas	1,716,914	1,948,054	-231,140	11.9	159,128
	2,343,406	2,359,410	-16,004	0.7	212,141
	1,941,499	2,332,849	-391,350	16.8	205,793
	6,338,309	6,389,690	-51,381	0.8	602,713
THE WEST					
Mountain: Montana Idaho Wyoming Colorado New Mexico Arizona Utah Nevada	452,519	559,381	-106,862	-19.1	57,129
	459,938	524,873	-64,935	-12.4	52,902
	234,553	249,873	-15,320	-6.1	23,978
	1,060,239	1,121,534	-61,295	-5.5	101,482
	490,302	531,785	-41,483	-7.8	50,234
	589,221	497,883	+91,338	+18.3	48,983
	591,910	550,062	+41,848	+7.6	55,192
	135,689	110,124	+25,565	+23.2	12,937
Pacific: Washington Oregon California	1,953,725	1,732,365	+221,360	+12.8	168,267
	1,193,702	1,088,476	+105,226	+9.7	112,286
	8,120,105	6,858,039	+1,262,066	+18.4	746,886

*This column indicates, roughly, the extent to which the civilian population was smaller than the total population of the states which would be comparable with the estimated total for the United States "including persons in the armed forces overseas."

Under this method, in the reapportionment based on the 1940 census, California gained three representatives, and six other states, namely, Arizona, Florida, New Mexico, North Carolina, Oregon and Tennessee each gained one. To balance these gains, since the number of representatives in the house was not changed, the following nine states each lost one representative; Illinois, Indiana, Iowa, Kansas, Massachusetts, Nebraska, Ohio, Oklahoma and Pennsylvania. The complete apportionment, which went into effect with the 78th congress, elected in 1942, is shown in Table V, with comparative figures indicating the changes from the apportionment based on the census of 1030.

Under the discarded method of major fractions, which measured deviation from equality among states solely by numerical difference in average number of representatives per 1,000,000 of population, Arkansas would have lost one representative to Michigan. Under the 1940 apportionment of 7 representatives to Arkansas and 17 to Michigan.

Table V.—Apportionment of Representatives in Congress on Basis of 1930 and 1940 Censuses

		_		
	Representa- tives in 77th congress	Representa- tives in 78th congress	Gain (+) or loss (–) in reappor-	Population per representa-
State	(1930 census)	(1940 census)	tionment	tive 1940
United States	. 435	435		301,164
Alabama	. 9	9	_	314,773
Arizong	. 1	2	+1	249,631
Arkansas	. 7	7		278,484
California	. 20	23	+3	300,321
Colorado	. 4	4		280,824
Connecticut	. 6	6	_	284,874
Delaware	. 1	1		266,605
Florida	. 5 . 10	6	+1	316,236
Georgia	. 10	10	-	312,372
Idaho	2	_2	-	262,437
Illinois	. 27	26	-1	303,740 311.618
Indiana	. 12	11	1 1	317,284
lowa	• 5	8	•	300,171
Kansas	. /	6 9	~1	316,181
Kentucky	. 2 . 27 . 12 . 7 . 7	8	_	295,485
Louisiana	. ĕ	3	-	282,409
Maine	. 3	8	_	303,541
Maryland	٠ ,٥	14	-1	308,337
Massachusetts	. 15 . 17	17	1	309,183
Michigan	٠ '	' ' 9		310,256
Minnesota	• 7	7	_	311,971
Mississippi	. 9 . 7 . 13 . 2 . 5	7 13 2 4	_	291,128
Montana	• '5	' 2		279,728
Nebraska	. 5	ã	~1	328,959
Nevada	i	ĩ	<u>.</u>	110,247
New Hampshire	. ż			245,762
New Jersey	. 14	14	-	297,155
New Mexico	. i	2 45	+1	265,909
New York	. 45	45	· - -	299,536
North Carolina	. 11	12	+1	297,635
North Dakota	. 2	2	-	320,968
Ohio	. 24	23	~1	300,331
Oklahoma	. 9	8	-1	292,054
Oregon	. 3	4	+1	272,421
Pennsylvania	. 34	33	-1	300,005
Rhode Island	. 2 . 6 . 2 . 9	2 6 2 10	_	356,673
South Carolina	. 6	6	-	316,634
South Dakota	. 2	. 2		321,481
Tennessee	. 9	10	+1	291,584
Texas	. 21	21	_	305,468
Utah	. 2 . 1	2		275,155
Vermont	. !	1	_	359,231 297,530
Virginia	. 9 . 6	9	_	289,365
Washington	. 8	8		316,996
West Virginia	. 18	10		313,759
Wisconsin	. 10	10	_	250,742
Wyoming	. 1	ı		230,742

igan, the average number of representatives per 1,000,000 is respectively 3.5909 and 3.2343, with a difference of 0.3566; with 6 representatives for Arkansas and 18 for Michigan, the respective averages would have been 3.0779 and 3.4246, with a (smaller) numerical difference of 0.3467. The percentage difference between the two figures based on the 1940 apportionment, however, is 11.02%, as compared with 11.26% after the proposed change; and on the basis of average population per representative, both absolute and percentage differences are smaller under the 1940 apportionment. The assignment of representatives to all the other states would have been the same in 1940 under either method; and in 1930, when both methods were in effect, there were no differences whatever in their assignments.

The state with the largest population per representative under the 1940 apportionment was Vermont, with 359,231; this state lost one of its two representatives in the reapportionment on the basis of the 1930 census, and thus suffered the largest possible (percentage-wise) reduction in representation. The state with the next to the largest figure (356,673) was Rhode Island, which lost one of its three representatives in the 1930 reapportionment; and the state with the next figure (328,959) was Nebraska, which lost one of its five representatives in the 1940 reapportionment. At the other end of the scale was Nevada, which by reason of its very small population and the constitutional requirement that each state should have one representative, had that one representative for a population of only 110,247.

Immigration and Emigration.—The immigration and emigration figures most frequently used continued to be

those representing arrivals in the United States (including its territories and possessions) from foreign countries and departures from the United States to foreign countries. Persons arriving in the United States continued to be classified as immigrant aliens, nonimmigrant aliens and citizens. Nonimmigrant aliens included persons in continuous transit through the United States, temporary visitors for business or pleasure, government officials, their families, attendants, servants and employees, etc. The figures for immigrant alien arrivals were exclusive of the relatively small number refused admission. The annual data on emigration and immigration as thus defined arc summarized for the years from 1937 to 1945 in Table VI. The figures shown in this table for later years are appreciably smaller than those given in Table II as an element in population increase, since the latter include arrivals in continental United States from the territories and possessions as well as from foreign countries. The number of such arrivals for the year ending June 30, 1944, was about 25,000, and for the year ending June 30, 1945, about 17,000.

The number of persons officially recorded as immigrants or emigrants in a given year represents only a small fraction of the whole number of persons who crossed the national borders. By far the major part consists of persons who crossed and recrossed, perhaps daily, for temporary purposes. The whole number of crossings during the fiscal year ending June 30, 1945, amounted to more than 57,000,000, of whom 28,000,000 were aliens. These figures may be compared with the total of 377,934 immigrant arrivals and 38,119 arrivals of immigrant aliens. (See also Immigranton and Emigranton.)

Table VI.—Immigration and Emigration, 1937 to 1945
(A minus sign (—) denotes excess of departures)

Year ending June 30	Total	Immi- grant aliens	Non- immigrant aliens	United States citizens
1937—Arrivals	618,756	50.244	181,640	386,872
Departures	614,778	26,736	197,846	390,196
Excess of arrivals	3,978	23,508	-16,206	-3.324
1938 — Arrivals	659,696	67,895	184,802	406,999
Departures	620,489	25,210	197,404	397,875
Excess of arrivals	39,207	42.685	-12,602	9,124
1939—Arrivals	622,769	82,998	185,333	354,438
Departures	534,808	26,651	174,758	333,399
Excess of arrivals	87,961	56,347	10,575	21,039
1940 Arrivals	467,706	70,756	138,032	258,918
Departures	390,891	21,461	144,703	224,727
Excess of arrivals	76,815	49,295	-6,671	34,191
1941—Arrivals	327,719	51,776	100,008	175,935
Departures	257,438	17,115	71,362	168,961
Excess of arrivals	70,281	34,661	28,646	6,974
1942—Arrivals	229,692	28,781	82,4 <i>57</i>	118,454
_ Departures	187,768	7,363	67,189	113,216
Excess of arrivals	41,924	21,418	15,268	5,238
1943—Arrivals	210,571	23,725	81,117	105,729
_ Departures	121,125	5,107	53,615	62,403
Excess of arrivals	89,446	18,618	27,502	43,326
1944—Arrivals	250,636	28,551	113,641	108,444
_ Departures	147,934	5,669	78,740	63,525
Excess of arrivals	102,702	22,882	34,901	44,919
1945—Arrivals	377,934	38,119	164,247	175,568
_ Departures	196,381	7,442	85,920	103,019
Excess of arrivals	181,553	30,677	78,327	72,549

Births and Deaths.—The rise in the birth rate has already been cited as the principal factor contributing to the acceleration in the rate of population growth. In the calendar year 1944, 2,794,800 births were registered. This represented a decided increase as compared with the average of about 2,200,000 per year which prevailed from 1930 to 1940, but it was materially smaller than the maximum of 2,934,860 in 1943. The number of births registered in 1945 (approximately 2,744,000), was again smaller than in the preceding years, but this time only slightly smaller. It is evident, then, that while the birth rate showed a tendency to decline somewhat after 1943, the decline was moderate and the birth rate remained considerably higher than at any time between 1930 and 1940. It was anticipated that, with the return of service-

men from overseas and rapid demobilization, the birth rate might take another upswing and continue at thencurrent or somewhat higher rates for two or three more years, this view being supported by the rapid increase in the marriage rate in early 1946.

While the birth rate was relatively high, the death rate showed little increase over the average for the preceding ten years. Even military mortality, which amounted in total to around 300,000, was not sufficient to raise the number of deaths in any one year by more than about 150,000.

The most significant data on births and deaths which need to be considered in any study of trends in population growth are presented in Table VII, which gives for 1920, 1925, 1930, and each year from 1935 to 1945 the number of registered births and deaths and the annual rates per 1,000 of the population, based on registered data, these being the rates usually quoted. (See also BIRTH STATISTICS; DEATH STATISTICS.)

Table VII.—Registered Births and Deaths in the United States, With Rates, 1920 to 1945

(Figures for years prior to 1935 are for the registration area, representing, for births, 59.7% of the population in 1920, 76.2% in 1925 and 94.7% in 1930; for deaths, 80.9% in 1920, 88.1% in 1925 and 95.3% in 1930).

	Births regi	stered	Deaths re	gistered
Year	Number	Rate per 1,000 pop.	Number	Rate per 1,000 pop.
1920	1,508,874 1,878,880 2,203,958 2,155,105 2,144,790 2,203,337 2,286,962 2,265,588 2,360,399 2,513,427 2,808,996 2,934,860 2,794,800	23.7 21.3 18.9 16.9 16.7 17.1 17.6 17.3 17.9 18.9 20.9 21.5 20.2	1,118,070 1,191,809 1,327,240 1,392,752 1,479,228 1,450,427 1,381,391 1,387,897 1,417,269 1,397,642 1,385,187 1,459,544 1,411,338	13.0 11.7 11.3 10.9 11.6 11.3 10.6 10.7 10.5 10.4 10.9 10.6
1945*	2,744,000	19.8	1,397,000	10.6

Marriages and Divorces.—The number of marriages in the United States increased rapidly under stress of approaching war conditions from 1939 to 1942 and then declined slowly in 1943 and still further in 1944 to a figure definitely below the 1940 level. The number of marriages in 1945 increased by 150,000 (to 1,618,331), but still was lower than the records of either 1941 or 1942. What actually took place in 1945 was a continued decline during the first half of the year, as indicated by the monthly reports of marriage licences issued, followed by a new increase in the second half based, first, on the promise of recovery from wartime restrictions and then reflecting the actual return of large numbers of servicemen from the war areas. The annual data from 1937 to 1945 for both marriages and divorces are summarized in Table VIII, with rates per 1,000 of the total population. Monthly reports on marriage licences issued in cities of 100,000 inhabitants or more (comprising about one-third of the total population of the United States) indicated that the increase in the marriage rate continued through the first half of the year 1946; in fact, the number of licences reported from these cities in the first six months of 1946 exceeded by more than 50% the number reported for the same months in 1945. These figures gave a strong indication that the number of marriages in 1946 would exceed by a considerable margin the earlier peak of 1,772,132 attained

In comparison with the ups and downs of the marriage rate, the divorce rate showed a steady increase from 1938 to 1945. The number of divorces granted in the years from 1937 to 1940, inclusive, was around 250,000 and the rate around 2.0 per 1,000 of the total population. In the next four years there was an annual increase of about 11%

in the number of divorces, bringing the number up to 400,000 in 1944, with a rate of 2.9. The increase in the number of divorces in the next year amounted to more than 25%, the total of 502,000 divorces granted in 1945 representing 3.6 per 1,000 of the population. While the ratio of divorces to marriages must be interpreted with duc regard for the fact that the divorces represent the dissolution of marriages contracted in earlier years, running back in considerable numbers for 20 years or more, the increase in this ratio from 17.2 divorces per 100 marriages in 1937 and 18.1 in 1942, the peak year for marriages, to 31.0 in 1945 was surely significant. (See also Marriage and Divorce.)

Table VIII.—Estimated Number of Marriages and Divorces in the United States, 1937 to 1945 Rates are based on total population, including, for 1942–45, persons in the armed forces overseas)

						Marria	Marriages !					
Yea	r					Number	Rate per 1,000 pop.	Number	Rate per 1,000 pop.	Per 100 mar- riages		
1937						1,451,296	11.3	249.000	1.9	17.2		
1938						1,330,780	10.3	244.000	1.9	18.3		
1939						1,403,633	10.7	251,000	1.9	17.9		
1940						1,595,879	12.1	264,000	2.0	16.5		
1941			٠			1,695,999	12.7	293,000	2.2	1 <i>7</i> .3		
1942				٠	٠	1,772,132	13.2	321,000	2.4	18.1		
1943						1,577,050	11.6	359,000	2.6	22.8		
1944					٠	1,452,394	10.5	400,000	2.9	27.5		
1945						1,618,331	11.6	502,000	3.6	31.0		

Urban-Rural Areas.—The urban population continued to be treated as comprising in general all persons living in incorporated places (cities, towns, villages or boroughs) having a population of 2,500 or more, with the rural population comprising persons living outside such places. On April 1, 1940, the urban population numbered 74,423,702, and the rural population 57,245,573. In 1930 the urban population was 68,954,823, and the rural population 53,820,223. The increase in the urban population between 1930 and 1940 thus amounted to 5,468,879, or 7.9%, and the increase in the rural population to 3,425,350, or 6.4%. The urban population in 1940 formed 56.5% of the total population of the United States, as compared with 56.2% in 1930.

The growth of the urban population was very much slower in the decade 1930-40 than in the preceding decade -7.9% as compared with 27.3%; the increase in the rural population during the decade 1930-40, on the other hand, was more rapid, in spite of the decided slowing down in the rate of growth of the total population, than in the period between 1920 and 1930-6.4% as compared with 4.4%. To make the comparison between the two decades in another way: For the decade ending in 1930, the rate of urban growth was more than six times the rate of rural growth (27.3% as against 4.4%), while in the decade ending in 1940 the rate of urban growth was only slightly higher than the rural rate (7.9% as compared with 6.4%).

The marked decline in the rate of urban growth was attributable in large measure to the economic conditions prevailing in the 1930s. These conditions discouraged the movement of population from rural to urban areas and also reduced somewhat the rate of natural increase; hence the urban areas gained far less than in previous decades from the inflow of rural migrants, and somewhat less from the excess of births over deaths.

The decennial figures on urban and rural population are summarized for the entire period covered by the United States census, from 1790 to 1940, in Table IX. Estimates based on a small sample for 1944 indicated that the civilian urban population on that date amounted to 74,570,000 out

of a total civilian population of 125,150,000, or 59.6%, as compared with 56.7% in 1940, with a corresponding decline in the percentage rural from 43.3% in 1940 to 40.4% in 1944. These figures seemed to indicate a resumption of the urban trend which was in force up to 1930, but which was practically suspended during the decade ending in 1940.

Table IX.—Urban and Rural Population of the United States, 1790 to 1940

				Perc	ent of		
Census		Population		increase prece cen	ding	Per c tote popul	
year	Total	Urban	Rural	Urban	Rurai	Urban	
1790	3,929,214	201,655	3,727,559		_	5.1	94.9
1800	5,308,483	322,371	4.986.112	59.9	33.8	6.1	93.9
1810	7,239,881	525,459	6.714.422	63.0	34.7	7.3	92.7
1820	9.638.453	693,255	8,945,198	31.9	33.2	7.2	92.8
1830	12,866,020	1,127,247	11,738,773	62.6	31.2	8.8	91.2
1840	17,069,453	1,845,055	15,224,398	63.7	2 9. 7	10.8	89.2
1850	23,191,876	3,543,716	19,648,160	92.1	29.1	15.3	84.7
1860	31,443,321	6,216,518	25,226,803	75.4	28.4	19.8	80.2
1870	38,558,371	9,902,361	28,656,010	59.3	13.6	25.7	74.3
1880	50,155,783	14,129,735	36,026,048	42.7	25.7	28.2	71.8
1890	62,947,714	22,106,265	40,841,449	56.5	13.4	35.1	64.9
1900	75,994,575	30,159,921	45,834,654	36.4	12.2	39.7	60.3
1910	91,972,266	41,998,932	49,973,334	39.3	9.0	45.7	54.3
1920	105,710,620	54,157,973	51,552,647	29.0	3.2	51.2	48.8
1930	122,775,046	68,954,823	53,820,223	27.3	4.4	56.2	43.8
1940	131,669,275	74,423,702	57,245,573	7.9	6.4	56.5	43.5

There were 3,464 urban places in the United States in 1940, as compared with 3,165 in 1930. The increase was the net result of the addition of 344 new places in the 1940 data, and the dropping of 45 places from the 1930 list. Most of the new urban units were incorporated places that attained a population of 2,500 or more during the decade 1930–40 and thus qualified as urban, although 20 of them were places not incorporated until after 1930. Of the 45 places taken off the urban list, most were dropped because of decreases to below the 2,500 limit, though a few disappeared through annexations to other urban places or disincorporation.

The urban and the rural population of the United States are presented in Table X, with further subdivision—the urban into groups of places classified according to size, and the rural into groups comprising small incorporated places and unincorporated territory.

Individual Cities.—According to the returns of the 1940 census, there were 37 cities in the United States having 250,000 inhabitants or more, the total population of these cities being 30,195,339. These 37 cities had a population of only 28,761,272 in 1930, thus showing an increase of 1,434,067 during the decade. This change represented an increase in population amounting to 5.0% between 1930 and 1940, as compared with 23.4% for the same cities between 1920 and 1930, the decline in the rate of increase between the two decades being somewhat greater for these cities than for the total urban population. The population of the individual cities making up the group having 250,000 inhabitants or more is shown in Table XI.

Table X.—Population of the United States in Groups of Places Classified According to Size, 1940 and 1930

	M	1940	_		1930	
Area and Class of Places	Number of places	Population	Per cent of total population	Number of	B 1.1	Per cent of total
Continental United States	-	131,669,275	100.0	places 	Population 122,775,046	population 100.0
Urban territory	3,464	74,423,702	56.5	3,165	68,954,823	56.2
Places of 500,000 to 1,000,000	9	15,910,866 6,456,959	12.1 4.9	5 8	1 <i>5</i> ,064,555 5,763,987	12.3 4.7
Places of 250,000 to 500,000	23 [,] 55	7,827,514 7,792,650	5.9 5.9	24	7,956,228	6.5
Places of 50,000 to 100,000	107	7,343,917,	5.6	56 98	7,540,966 6,491,448	6.1 5.3
Places of 25,000 to 50,000	213 665	7,417,093 9,966,898	5.6 7.6	18 5 606	6,425,693 9,097,200	5.2
Places of 5,000 to 10,000	965 1,422	6,681,894	5.1	851	5,897,156	7.4 4.8
Rural territory	1,422	5,025,911 57,245,573	3.8 43.5	1,332	4,717,590	3.8
incorporated places of 1,000 to 2,500 . incorporated places under 1,000	3,205	5,026,834	3.8	3,087	53,820,223 4,820,707	43.8 3.9
Unincorporated territory	10,083	4,315,843 47,902,896	3.3 36.4	10,346	4,362,746 44,636,770	3.6 36.4

One city which was on the list of those with 250,000 inhabitants or more in 1930, namely, Akron, Ohio, fell out of the list in 1940 by reason of a reduction in population from 255,040 to 244,791. Its place was taken, however, by San Antonio, Tex., which came into the group through an increase in population from 231,542 in 1930 to 253,854 in 1940, so that the number of cities remained the same.

Table XI.—Population of Cities of 250,000 or More, Arranged According
To Size, 1940 and 1930
(A minus sign (—) denotes decrease)

	(, , , , , , , , , , , , , , , , , , ,	, ,		Per c	ent of
	Popu	lation		incr	ease
	•		increase	1930-	1920-
City	1940	1930	1930-40	40	30
Total	30,195,339	28,761,272	1,434,067	5.0	23.4
New York, N.Y.	7,454,995	6,930,446	524,549	7.6	23.3
Chicago, Ill.	3,396,808	3,376,438	20,370	0.6	25.0
Philadelphia, Pa	1,931,334	1,950,961	-19,627	-1.0	7.0
Detroit, Mich.	1,623,452	1,568,662	54,790	3.5	57.9
Los Angeles, Calif	1,504,277	1,238,048	266,229	21.5	114.7
Cleveland, Ohio	878,336	900,429	-22,093	-2.5	13.0
Baltimore, Md	859,100	804,874	54,226	6.7	9.7
St. Louis, Mo	816,048	821,960	-5,912	-0.7	6.3
Boston, Mass		781,188	-10,372	-1.3	4.4
Pittsburgh, Pa	671,659	669,817	1,842	0.3	13.8
Washington, D.C.	663,091	486,869	176,222	36.2	11.3
San Francisco, Calif.	634,536	634,394	142		25.2
Milwaukee, Wis	587,472	578,249	9,223	1.6	26.5
Buffalo, N.Y.	575,901	573,076	2,825	0.5	13.1
New Orleans, La.	494,537	458,762	35,775	7.8	18.5
Minneapolis, Minn.	492,370	464,356	28,014	6.0	22.0
Cincinnati, Ohio	455,610	451,160	4,450	1.0	12.4
Newark, N.J.	429,760	442,337	1 2,577	-2.8	6.7
Kansas City, Mo	399,178	399,746	568	-0.1	23.2
Indianapolis, Ind :	386,972	364,161	22,811	6.3	15.9
Houston, Tex	384,514	292,352	92,162	31.5	111.4
Houston, Tex	368,302	365,583	2,719	0.7	15.9
Rochester, N.Y	324,975	328,132	-3,1 <i>57</i>	-1.0	10.9
Denver, Colo	322,412	287,861	34,551	12.0	12.2
Louisville, Ky	319,077	307,745	11,332	3. <i>7</i>	31.0
Columbus, Óhio	306,087	290,564	15,523	5.3	22.6
Portland, Ore	305,394	301,815	3,579	1.2	16.9
Atlanta, Ga	302,288	270,366	31,922	11.8	34.8
Oakland, Calif	302,163	284,063	18,100	6.4	31.4
Jersey City, N.J	301,173	316,715	-15,542	4.9	6.2
Dallas, Tex	294,734	260,475	34,259	13.2	63.8
Memphis, Tenn	292,942	253,143	39 <i>,</i> 799	1 <i>5.7</i>	55.9
St. Paul, Minn	287,736	271,606	16,130	5.9	15.7
Toledo, Ohio	282,349	290,718	-8,369	-2.9	19.6
Birmingham, Ala	267,583	259,678	7,905	3.0	45.2
San Antonio, Tex	253,854	231,542	22,312	9.6	43.5
Providence, R.I	253,504	252,981	523	0.2	6.5

Metropolitan Districts.—Prior to 1940, census statistics were presented almost exclusively for geographic areas with legally established political boundaries, that is, for states, counties, townships and cities. To an increasing extent, however, the population tributary to a fairly large city was expanding into the area outside the corporate limits of the city. There was, therefore, an increasing demand for statistics relating to this entire area, including both the city and the thickly settled adjacent area. Metropolitan districts were established for the 25 largest cities in 1910, for 29 in 1920 and for 96 in 1930, but little information beyond total population was tabulated for these dates. In 1940, metropolitan districts were set up for all cities of 50,000 or more, 140 in all, and most of the important classifications presented in the census reports on population and housing were shown for the metropolitan districts -or at least for the more important ones-as well as for the central cities. This represented an expansion in the

geographic classification of the census figures perhaps even more important than the very great extension in the use of urban-rural areas which was incorporated in the reports of the 1950 census.

The general plan followed in setting up the metropolitan districts was to include in the district, in addition to the central city or cities, all adjacent and contiguous townships or other minor civil divisions and incorporated places having a population of 150 or more per square mile. A metropolitan district was thus not a political unit but rather an area including all the thickly settled territory in and around a city or group of cities. It tended to be a more or less integrated area, with common economic, social, and often administrative interests.

The .11 metropolitan districts having a population of 1,000,000 or more are listed in Table XII, which gives separately the population of the central city and the outside area in each district. As indicated by the figures in the last column of this table, there was a wide diversity among the cities in the relation between the population of the central city and the population outside, the differences representing mainly actual differences in the composition of the territory immediately surrounding the city.

Table XII.—Population of Metropolitan Districts Having 1,000,000 Inhabitants or More, 1940

District	Total	In central city (or cities)	Outside central city	Per cent outside
Baltimore, Md	1,046,692	859,100	187,592	17.9
Boston, Mass	2,350,514	770,816	1,579,698	67.2
Chicago, III	4,499,126	3,396,808	1,102,318	24.5
Cleveland, Ohio	1,214,943	878,336	336,607	27.7
Detroit, Mich	2,295,867	1,623,452	672,415	29.3
Los Angeles, Calif	2,904,596	1,504,277	1,400,319	48.2
New York-Northeastern N.J	11,690,520	7,454,995 \ *980,501 }	3,255,024	27.8
Philadelphia, Pa	2,898,644	1,931,334	967,310	33.4
Pittsburgh, Pa	1,994,060	671,659	1,322,401	66.3
St. Louis, Mo	1,367,977	816,048	551,929	40.3
San Francisco-Oakland, Calif	1,428,525	634,536 \ 302,163	491,826	34.4
Total, 11 districts having 1,000,000 inhabitants or more All metropolitan districts (140).	33,691,464	21,824,025	11,867,439	35.2
including 129 smaller districts	62,965,773	42,796,170	20,169,603	32.0

^{*}Population of Elizabeth, Jersey City, Newark and Patterson.

Sex Distribution.—Up to about 1940, the population of the United States contained a considerable excess of males. The sex ratio, that is, the number of males per 100 females, ranged from 103.3 in 1820 to high points of 105.0 in 1890 and 106.0 in 1910, both of which years had been preceded by the arrival of large numbers of European immigrants who were then dominantly male. The numerical excess of males in the 1910 population of 91,972,266 amounted to 2,692,288. Following 1910, however, there was a rather rapid decline in the sex ratio and correspondingly in the numerical excess of males over females, until in 1940 there were only 100.7 males per 100 females and less than 460,000 more males than females in the count of the population. In the estimates for July 1, 1944, the numbers of males and females were almost exactly equal, and the sex ratio, computed to the nearest tenth, was 100.0, while in 1945 there were 231,469 more females than males in the estimated population, or 99.7 males per 100 females. According to the forecasts made for 1950 and subsequent years, the excess of females would reach a maximum of

1,468,000 in 1970 (98.2 males per 100 females), then decline rather rapidly to 371,000 (or 99.5 males per 100 females) in the year 2000.

The sex distribution of the population of the United States, including current estimates and forecasts, is presented for the years from 1820 to 2000 in Table XIII.

Table XIII.—Population of the United States by Sex, 1820-1945, With Forecasts to the Year 2000

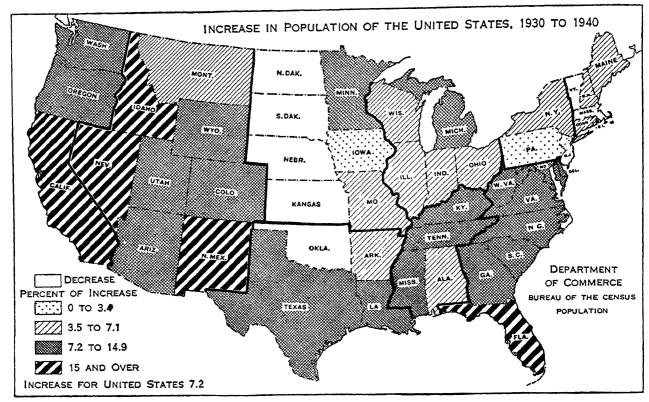
Year Census:					Total	Male	Female	Males per 100 females	
1820					9,638,453	4,896,605	4,741,848	103.3	154,757
1830		:			12,866,020	6,532,489	6,333,531	103.1	198,958
1840		:			17,069,453	8,688,532	8,380,921	103.7	307,611
1850	-	:	-		23,191,876	11,837,660	11,354,216	104.3	483,444
1860		:	-	-	31,443,321	16,085,204	15,358,117	104.7	727,087
1870		:		-	38,558,371	19,493,565	19,064,806	102.2	428,759
1880	-	:		-	50,155,783	25,518,820	24,636,963	103.6	881,857
1890		:			62,947,714	32,237,101	30,710,613	105.0	1,526,488
1900	-	:	_		75,994,575	38,816,448	37,178,127	104.4	1,638,321
1910	-	:	-		91,972,266	47,332,277	44.639.989	106.0	2,692,288
1920		:			105,710,620	53,900,431	51,810,189	104.0	2,090,242
1930		:			122,775,046	62,137,080	60,637,966	102.5	1,499,114
1940					131,669,275	66,061,592	65,607,683	100.7	453,909
	·	·	Ť	Ī	, , , , , , , ,	00,001,072	00,00,,000	,	Excess of
Estimate:					100 /01 /01		10.001.150	00.7	females
1945*	٠	•	٠	٠	139,621,431	69,694,981	69,926,450	99.7	231,469
Forecast:					1 45 440 000	70.007.000	73.06 2.000	00.1	440,000
1950		٠			145,460,000	72,396,000		99.1	668,000
1960		٠	-	-	153,375,000	76,047,000	77,328,000	98.3	1,281,000
1970		٠			159,847,000	79,189,000	80,657,000	98.2	1,468,000
1980		•			163,877,000	81,293,000	82,583,000	98.4	1,290,000
1990		٠			164,585,000	81,861,000	82,724,000	99.0	863,000
2000	٠	٠	٠	٠	1 63,312,000	81,470,000	81,841,000	99.5	371,000
*Includin	a	or	ne	di	forces overseas.				

Age Composition.—The population of the United States, like that of most industrialized countries, continued to grow older. Two factors contributing to this situation were the declining birth rate, which resulted in the addition of relatively smaller numbers of children to the population in successive generations, and the improvement in health conditions, which increased the span of life. The figures in Table XIV indicate the changing age composition of the population of the United States over a period of 100 years, comprising census figures for 1880, 1910 and 1940, estimates for 1945, and forecasts for 1950 and 1980. The percentage of the population under 15 years of age in 1880 was 38.1, which figure had declined to 25.0 in 1940. In 1945, by reason of the temporary increase in the birth rate commented on above, 25.1% of the population were under 15, and the effect of the higher birth rate carried forward into the forecast for 1950, which showed 25.7% under 15 years of age. By 1980, however, as indicated by the forecast, the earlier tendency would be resumed, and the percentage under 15 would be down to 20.9%—and down to 19.1% in the year 2000. Conversely, the percentage of the population 65 years old and over showed a continuous increase from 3.4% in 1880 to 6.9% in 1940 and 7.2% in 1945; according to forecasts, it would be 11.6% in 1980 and 13.2% in the year 2000.

Table XIV.—Population of the United States by Age, 1880-1945, With Forecasts for 1950 and 1980

	•	(Census populat	ion	Estimate,	Fore	Per cent distribution						
Age		1880	1910	1940	1945*	1950	1980	1880	1910	1940	1945	1950	1980
All ages			91,972,266	131,669,275	139,621,431	145,460,000	163,877,000	100.0	100.0	100.0	100.0	100.0	100.0
Under 5 years		6,914,516	10,631,364	10,541,524	13,146,910	12,141,000	10,574,000	13.8	11.6	8.0	9.4	8.3	ູ 6.5
5 to 9 years		6,479,660	9,760,632	10,684,622	11,347,130	13,894,000	11,714,000	12.9	10.6	8.1	8.1	9.6	" 7.1
10 to 14 years			9,107,140	11,745,935	10,649,314	11,301,000	11,896,000	11.4	9.9	8.9	7.6	7.8	7.3
15 to 19 years			9,063,603	12,333,523	11,651,506	10,592,000	11,573,000	10.0	9.9	9.4	8.3	7.3	7. 1
20 to 24 years			9.056.984	11,587,835	12,157,729	11,555,000	11,241,000	10.1	9.8	8.8	8. <i>7</i>	7.9	6.9
25 to 29 years			8.180.003	11,096,638	11,469,639	12,030,000	11,559,000	8.1	8.9	8.4	8.2	8.3	7.1
30 to 34 years			6.972.185	10,242,388	11.006.658	11,329,000	12,507,000	6.7	7.6	7.8	7.9	7.8	7.6
35 to 39 years			6.396.100	9,545,377	10.151.305	10,829,000	13,362,000	6.0	7.0	7.2	7.3	7.4	8.2
40 to 44 years			5.261.587	8.787.843	9,400,648	9,928,000	10,720,000	4.9	5.7	6.7	6.7	6.8	6.5
45 to 49 years			4,469,197	8,255,225	8.551.248	9,103,000	9.865,000	4.2	4.9	6.3	6.1	6.3	6.0
50 to 54 years			3,900,791	7,256,846	7,884,005	8.145,000	10.458.000	3.7	4.2	5.5	5.6	5.6	6.4
55 to 59 years			2,786,951	5,843,865	6.788.763	7.329,000	10,366,000	2.5	3.0	4.4	4.9	5.0	6.3
60 to 64 years			2,267,150	4,728,340	5,306,135	6,089,000	8,977,000	2.2	2.5	3.6	3.8	4.2	5.5
65 to 69 years			1.679.503	3,806,657	4,070,875	4,511,000	7,443,000	1.4	1.8	2.9	2.9	3.1	4.5
				2,569,532	2,962,283	3.184.000	5.424.000	1.0	1.2	2.0	2.1	2.2	3.3
70 to 74 years			1.156.293	2,643,125	3,077,283	3,498,000	6,198,000	1.0	1.3	2.0	2.2	2.4	3.8
75 and over		302,141	169.055	2,040,120	0,077,200	0,470,000	o,o,		0.2				
Not reported		_	109,033						V.2				

^{*}Estimate includes persons in armed forces overseas.



The net effects of the changing age composition of the population can be more briefly summarized through the use of the median age, which may be defined as the age of the person who would stand at the midpoint of the series if the entire population were arranged in order according to age. These medians are presented for the years from 1820 to 2000, with figures for males and females and white and nonwhite, in Table XV. The median age increased from 16.7 in 1820 to 29.0 in 1940 and 29.7 in 1945, and was expected to reach 35.3 in 1980 and 37.4 in the year 2000.

Table XV.—Median Age of the Population of the United States, by Sex, 1820 to 1945, With Forecasts to the Year 2000

												Total	Ву	sex	By c	olour
Year												popu- lation	Male	Female	White	Non- white
												10.1011	711010	, cinale	***************************************	WILLIA
Census:												1/7	1//	1/7	115	170
1820	٠	•	٠	٠	٠	•	•	•	•	٠	•	16.7	16.6	16.7	16.5	17.2
1830	٠	٠	٠	•	٠	٠	٠	٠	٠	•	٠	17.2	17.1	17.3	17.2	16.9
1840	٠	٠	٠	٠	٠	٠	٠	٠	•	•	٠	17.8	17.8	17.7	17.9	17.3
1850	٠	٠	٠	٠	•	٠	٠	٠	٠	٠	•	18.9	19.2	18.6	19.2	17.4
1860	٠	•	•		٠	٠	٠	٠		•	٠	19.4	19.8	19.1	19.7	17.5
1870			٠	٠		٠			٠			20.2	20,2	20.1	20.4	18.5
1880			٠	٠					٠			20,9	21.2	20.7	21.4	18.0
1890									٠			22.0	22.3	21.6	22.5	18.4
1900												22.9	23.3	22.4	23.4	19.7
1910												24.1	24.6	23.5	24.5	21.1
1920	Ĭ	-										25.3	25.8	24.7	25.6	22.4
1930											-	26.5	26.7	26.2	26.9	23.5
1940	Ī	Ī	Ĭ	Ī	Ī	Ĭ		Ï	:	-		29.0	29.1	29.0	29.5	25.2
	•	•	•	٠	•	•	•	٠	•	٠	•			~7.0	27.0	20.2
Estimate:																
1945*	٠	•	٠	٠	٠	٠	٠	٠	٠	٠	•	29.7	29.5	29.9	30.3	25.3
Forecast:																
1950											_	30.5	30.0	31.1	31.2	25.6
1960								:			-	32.7	31.8	33.5	33.4	26.5
1970				-							-	33.5	32.5	34.6	34.4	27.9
1980	:	•	•	•	•	:	•	•	•	•	-	35.3	34.4	36.2	36.1	30.0
1990	:		•		•		Ī	•	•	•		36.8	35.9	37.8	37.7	31.2
2000	•	•	•	•	•	•	•	•	•	•		37.4	36.5	38.3	38.2	32.7
	٠.	٠.	٠.	٠.	٠	٠	•	:	٠	•	٠.			00.0	55.2	G2.7
"Estimat	e i	nc	lud	les	P	ers	on:	s Tu	n d	rır	ed	forces ov	erseas.			

The median ages for males and females were about the same as computed on the basis of the 1940 census, but the forecasts indicated that even in 1950 the median age for females would be higher by more than a year, with continued increases in this margin in subsequent decades. The median age of the white population in 1940 was 29.5 years, as compared with 25.2 for the nonwhite population.

Incidentally, the median age of the white population in 1940 was the resultant of combining the native white, with a median of 26.9, with the foreign-born white, with a median of 51.0. The median age of the foreign born was likely to continue increasing rather rapidly, though with declining numbers the higher ages of the foreign born would have less effect on the average for the total population.

Race and Nativity.—The white population formed practically the same proportion of the total population in 1940 as in 1930, the percentage being 89.8 in both years, though the rate of increase for the white population was slightly lower than for the nonwhite. The native white population taken alone increased by 10.9%. (See discussion of the various subdivisions of the white population below.) The Negro population increased by 8.2% between 1930 and 1940, or materially less than the native white, while the minor races collectively decreased by 1.4%. The distribution of the 1940 population of the United States by race is shown, by regions, in Table XVI.

The racial distribution of the population of the three regions was by no means uniform. The population of both the north (comprising all the states as far west as the Dakotas and as far south as Pennsylvania, Indiana and Missouri) and the west (comprising the states from Montana south to New Mexico and westward) was 96.2% white in 1940, while the population of the south (comprising the states from Delaware, Kentucky and Oklahoma southward) was only 76.0% white. The foreign-born whites formed 12.3% of the population in the north and 10.3% in the west, but only 1.5% in the south. More than threefourths of the Negroes were in the south; a little more than one-fifth were in the north (mainly in the cities). where they formed 3.7% of the population; and only a small number in the west, where they formed 1.2% of the population in 1940, though by reason of migration to warproduction centres their numbers in this region had materially increased by 1945. The other nonwhite races, mainly Indians and Mongolians, were largely concentrated in the west, where they formed 2.6% of the total in 1940, as against a small fraction of 1% in the north and the south.

The Negro population, it may be noted, was practically all (99.3%) native, as were likewise the Indians, while the Chinese were about evenly divided between native and foreign born.

Nativity and Parentage.

—While the percentage white in the total population of the United States remained practically unchanged from 1930 to 1940, the distribution of the white population by nativity and parentage changed

very materially during this period. The number of foreignborn whites decreased from 13,983,405 in 1930 to 11,419,-138 in 1940, or 18.3%. The native white population increased during the same period from 96,303,335 to 106,-795,732, or 10.9%. This increase, amounting to 10,492,397, exceeded by more than 1,500,000 the increase in the total population.

The native white population was further classified on the basis of nativity of parents into (1) persons of native parentage and (2) persons of foreign or mixed parentage. The second group was then further subdivided into those having both parents foreign born and those having one parent foreign born and the other native. This classification is shown in full detail in Table XVII.

The number of native white persons of native parentage increased 19.0% between 1930 and 1940, while the whole number of persons of foreign or mixed parentage decreased 11.0%, and those of foreign parentage, taken alone, decreased 13.2%. The changes in the proportion of the total white population represented by these various classes were perhaps even more significant than the changes in the absolute numbers. The percentage of the white population which was foreign born decreased from 12.7 in 1930 to 9.7 in 1940, and the percentage represented by native persons of foreign or mixed parentage decreased from 23.5 to 19.5, with corresponding increases in the percentages representing all native persons and natives of native parentage.

The decline in the proportion of foreign born was, of course, the direct result of the practical cessation of immigration from foreign countries during the decade 1930—40. The decline in the numbers of native persons of foreign or mixed parentage indicated that even the children of earlier immigrants were reaching the ages of heavy mortality and that because the foreign born were for the most part past the reproductive ages, there were few children to provide replacements at the lower end of the age scale.

Foreign White Stock.—The term "foreign white stock" was used in the census reports to indicate the combined total of two classes, namely, the foreign-born white and the native white of foreign or mixed parentage. The classification therefore included only those persons who were born abroad (sometimes referred to as the first generation)

Table XVI.—Population by Race for the United States, by Regions, 1940

		The United S	States	The Nor	th	The Sou	rth	The We	st
Race		Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent
All classes		131,669,275	100.0	76,120,109	100.0	41,665,901	100.0	13,883,265	100.0
White		118,214,870 106,795,732 11,419,138	89.8 81.1 8.7	73,206,738 63,836,960 9,369,778	96.2 83.9 12.3	31,658,578 31,032,902 625,676	76.0 74.5 1.5	13,349,554 11,925,870 1,423,684	96.2 85.9 10.3
Nonwhite Negro Indian Chinese Japanese Filipino Hindu Korean	• • • • • • • • • • • • • • • • • • • •	13,454,405 12,865,518 333,969 77,504 126,947 45,563 2,405 1,711	10.2 9.8 0.3 0.1 0.1	2,913,371 2,790,193 83,136 25,738 4,971 8,126 597 350	3.8 3.7 0.1 — —	10,007,323 9,904,619 94,139 4,926 1,049 2,351 169 40	24.0 23.8 0.2 — — —	533,711 170,706 156,694 46,840 120,927 35,086 1,639 1,321	3.8 1.2 1.1 0.3 0.9 0.3
All others	٠	788		260	_	30		498	

Table XVII.—White Population by Nativity and Parentage, 1940 and 1930
(Parentage classification for 1940 based on a tabulation of a 5% sample, adjusted to the total for native white. A minus sign (—)

	Number	Per cent of increase	Per cent o	əf
Nativity and parentage	1940 1930	1930-40	1940 1	930
Total	118,214,870 110,286,740	7.2	100.0 10	0.00
Native white		10.9 19.0		87.3 63.8
Foreign or mixed parentage	23,052,530 25,902,383	-11.0	19.5	23.5
Foreign parentage	15,114,858 17,407,527 7,937,672 8,494,856	-13.2 -6.6	12.8 1 6.7	15.8 7.7
Father foreign	5,243,250 5,547,325	5.5 8.6	4.4 2.3	5.0 2.7
Foreign-born white	11,419,138 13,983,405	-18.3	9. 7 1	12.7

and those who had at least one parent foreign born (the second generation) but not the third and later generations of persons of foreign ancestry—though these later generations sometimes retained many of the characteristics of the original immigrants.

In 1940, the foreign white stock numbered about 34,-600,000, or a little more than one-quarter of the total population of the United States. About 11,400,000, or roughly one-third of this number, were foreign born. Of the remaining 23,000,000, about 15,000,000 were persons with both parents foreign born; 5,000,000 had only the father foreign born, and something less than 3,000,000 had only the mother foreign born.

Table XVIII.—Foreign White Stock by Country of Origin, 1940 (Figures in last column based on a 5% sample tabulation, unadjusted)

Total

Native white

Country of origin	foreign white	Foreign- born	of foreign or mixed
	stock	white	parentage
All countries	3 <i>4,5</i> 76,718	11,419,138	23,157,580 4
England	1,975,975	621,975	1,354,000
Scotland	725,861	279,321	446,540
Wales	148,260	35,360	112,900
Northern Ireland	377,236	106,416	270,820
Irish Free State (Eire)	2,410,951	572,031	1,838,920
Norway	924,688	262,088	662,600
Sweden	1,301,390	445,070	856,320
Denmark	443,815	138,175	305,640
Netherlands	372,384	111,064	261,320
Belgium	130,358	53,958	76,400
Luxembourg	27,166	6,886	20,280
Switzerland	293,973	88,293	205,680
France	349,050	102,930	246,120
Germany	5,236,612	1,237,772	3,998,840
Poland	2,905,859	993,479	1,912,380
Czechoslovakia	984,591	319,971	664,620
Austria	1,261,246	479,906	781,340
Hungary	662,068	290,228	371,840
Yugoslavia	383,393	161,093	222,300
Russia (U.S.S.R.)	2,610,244	1,040,884	1,569,360
Latvia	34,656	18,636 165,771	16,020
Lithuania	394,811	117210	229,040
Finland	284,290	117,210	167,080 131,760
Rumania	2 <i>47,7</i> 00 1 <i>5,</i> 688	11 <i>5</i> ,940 8,888	6,800
Bulgaria	8,372	4,412	3,960
Turkey in Europe	326,672	163,252	163,420
Greece	4,594,780	1,623,580	2,971,200
Italy	109,407	47,707	61,700
Spain	176,407	62,347	114,060
Portugal	54,701	26,101	28,600
Other Europe	151,406	57,906	93,500
Palestine and Syria	95.839	52,479	43,360
Turkey in Asia Other Asia	85,924	39,524	46,400
Canada—French	908,386	273,366	635,020
Canada—Other	2,001,773	770,753	1,231,020
Newfoundland	47,001	21,361	25,640
	1,076,653	377,433	699,220
Mexico	65,714	30,534	35,180
Central and South America	67,568	36,408	31,160
Australia	26,898	10,998	15,900
	74,351	25,751	48,600
Azores	202,601	21,881	180,720
All other and not reported	202,001	21,001	100,720

The foreign white stock is classified by country of origin in Table XVIII. In this table the foreign born are classified by country of birth; those with both parents or with father alone foreign born are classified by country of birth of father, and those with mother alone foreign born, by country of birth of mother. The 1940 classification was based on the political boundaries of the countries as they were on Jan. 1, 1937.

In comparison with figures for earlier years, the 1940 data for all of the countries in northwestern Europe indicated very considerable decreases in the foreign white stock of both first and second generations from these countries. This situation is to be explained mainly by the fact that the bulk of the immigrants from these countries arrived in the United States earlier than from most other regions of Europe. The foreign born in particular from these countries were in 1940 concentrated in the older age groups, where the rate of mortality was high. Similar rates of decrease were likewise shown for Germany, Poland and other countries in central Europe.

In spite of a decline from 6,873,103 in 1930 to 5,236,612 in 1940, the German foreign white stock was still the largest in 1940, followed closely by the Italian, with 4,594,780, or about one-seventh of the total. Other countries contributing more than 2,000,000 were Canada, Poland, the U.S.S.R. and Eire, with England just under this limit.

Farm Population.—The farm population, as shown in the population census reports, comprises all persons living on farms, without regard to occupation. Since only about 1% of the entire farm population was found in urban areas, the statistics of the urban-farm population were limited to a simple count of its number. The main body of the farm population statistics therefore relate to the rural-farm population, which, together with the rural-nonfarm and the urban, make up a threefold classification of the total population. Statistics for these three classes, together with data for the total farm population, are presented in Table XIX, which shows also the sex ratio of the three classes.

The increase in the rural-farm population between 1930 and 1940 amounted to only 0.2%, whereas the increase in rural-nonfarm population amounted to 14.2%, or almost twice the rate of increase in either the total rural population or the urban population.

The number of males per 100 females in the rural-farm population was decidedly larger than in the urban population, 111.7% as compared with 95.5% in 1940, while the rural-nonfarm group occupied an intermediate point in this respect, with 103.7 males per 100 females.

The total farm population, including the small urbanfarm group, likewise increased very slightly between 1930 and 1940; and in the preceding decade there was an actual decrease of 3.7% in this figure, which may be contrasted with an increase of 27.3% in the urban population. The farm population was estimated for dates subsequent to

1940 as follows: Jan. 1944, 25,520,000; July 1944, 26,220,000; Jan. 1945, 25,190,000; July 1945, 26,260,000; Jan. 1946, 25,990,000.

These estimates, it must be remembered, represented the farm-resident part of the civilian population, less by some millions than the normal total population, since the farm population, up to July 1945, had lost something like 1,500,000 through inductions into the armed forces—and in addition, between 2,000,000 and 3,000,000 more through net migration from farms to nonfarm areas, mainly war production centres.

Internal Migration.—A survey of the movement of the civilian population (omitting persons in institutions) between Dec. 1941 and March 1945 indicates that 15,210,000 persons in 1945 were living in a county different from that in which they lived in 1941. Of this number, 7,670,000 had moved from one state to another, and 3,580,000 had moved from one to another of the three regions designated the north, the south and the west, as indicated by the figures in Table XX.

Table XX.—Migrants by Type, Dec. 1941 to March 1945, and April 1935 to April 1940 (Data for migration 1941–45 based on a small sample)

Type of migration	migration, Migration, 1941–45 1935–4 (3½ years) (5 years)	40
Total migrants	15,210,000 15,734,7	
Between states		
Between regions		
Between states in same region	4,090,000 3,847,3	
Between counties in same state	. 7,540,000 9,239,7	49

The interstate migration in this three and one-fourth year period somewhat exceeded the migration recorded in the 1940 census for the five-year period 1935–40, in which, out of a total of 15,734,798 intercounty migrants, 6,495,049 had crossed state lines and 2,647,651 had moved from one major region to another. A better measure of the relative extent of internal migration, as between these two periods, is perhaps the average per year. The average number of interstate migrants per year in the later period was 2,360,000 as compared with 1,300,000 in the earlier (and longer) period. Even this difference, however, represented rather less of an increase in mobility than one would have expected to find as a result of war conditions, with the extensive migration of workers to centres of war production.

The specific origin and destination of the inter-regional migration during the two periods is shown in Table XXI. Thus, of the 1,550,000 migrants between 1941 and 1945 from the north to other regions, 640,000 were found in the south at the end of the period, and 910,000 were found in the west. Of the 1,630,000 migrants from the south, 980,000 were found in the north and 650,000 in the west; and of the 400,000 migrants from the west, 260,000 were found in the north and 140,000 in the south. The west thus gained 1,160,000 through this inter-regional migration, while the north lost 310,000 and the south 850,000. The general pattern of the inter-regional migration between 1935 and 1940 was similar, though the net gain of the west in this period was only 886,940, while the north lost 614,629 and the south lost only 272,311. In other words, the westward movement was heavier from the north in the earlier of these two periods, and from the south in the later period.

Another feature of the survey just referred to was a question on farm residence at the beginning and the end of

Table XIX.—Urban, Rural and Farm Population of the United States, 1940 and 1930

			Per cent of		es per emales
Class	1940	1930	increase	1940	1930
Total population	131,669,275	122,775,046	7.2	100.7	102.5
Urban	74,423,702	68,954,823	7.9	95.5	98.1
Rural	57,245,573 27,029,385 30,216,188	53,820,223 23,662,710 30,157,513	6.4 14.2 0.2	107.8 103.7 111.7	108.3 105.0 111.0
Total farm population	30,546,911 30,216,188 330,723	30,445,350 30,157,513 287,837	0.3 0.2 14.9	_	

Period and region of residence at	Total migrants between	Region of residence at beginning of period			
end of period	regions	The North	The South	The West	
1941 to 1945					
Total	3,580,000 1,240,000 780,000 1,560,000	1,550,000 640,000 910,000	1,630,000 980,000 — 650,000	400,000 260,000 140,000	
Total	2,647,651 761,619 726,504 1,159,528	1,376,248 	998,815 598,972 — 399,843	272,588 162,647 109,941	

the period covered. The answers to this question, summarized in Table XXII, indicated that 5,440,000 people moved from farms to nonfarm areas, while 2,510,000 were found living on farms in 1945 who had been living in nonfarm areas in 1941. In this exchange the farm population sustained a net loss of 2,930,000. During the same period, the farm areas also lost about 1,500,000 through enlistments and inductions into the armed forces.

Table XXII.—Civilian Migration Between Farms and Nonfarm Areas, Dec. 1941 to March 1945 (Data based on a small sample)

ltem	From	From	Net loss
	farm to	nonfarm	to farm
	nonfarm	to farm	areas
Total farm-nonfarm migrants (all ages) Farm-nonfarm migrants 14 years old and over Farm-nonfarm migration involving movement—	5,440,000	2,510,000	2,930,000
	4,160,000	1,890,000	2,270,000
Between states	760,000	350,000	410,000
	920,000	510,000	410,000
	2,480,000	1,030,000	1,450,000

Because of the demand for workers in war production centres, the rate of migration from farms was much greater during this period than in normal times, though there had been for many years a continued and fairly extensive migration from farms to urban areas. The net loss through the movement of civilians from farms averaged around 900,000 a year in the period from 1941 to 1945, which may be compared with an average of 375,000 per year during the depression decade of the 1930s, and 630,000 per year during the 1920s.

This wartime migration to and from farms was largely a short-distance movement between a city or town and its surrounding rural areas. Of the 4,160,000 persons 14 years old and over who left the farm population, 2,480,000 moved from farm to nonfarm areas within the same county; 920,000 moved to a different county within the state; and only 760,000 moved from a farm in one state to a nonfarm area in another state. The reverse movement from nonfarm areas to farms was distributed in somewhat similar fashion.

Educational Attainment.—A new measure of the educational attainment of the population is represented by the data on last (or highest) full grade of school completed, or, to use a somewhat more convenient expression, the

number of years of school completed. The question on number of years of school completed was included in the 1940 census in place of the less comprehensive questions on illiteracy asked in previous censuses. The data for persons 25 years old and over, a group made up mainly of persons whose formal education had been completed, are summarized in Table

XXIII for the United States, and for its urban and rural areas.

Of the whole number of these persons, 2,799,923, or 3.7%, had never completed so much as one year of formal schooling, and an additional 9.8% had completed less than five years; 25,897,953, or 34.6% had completed the seventh or eighth grade; 10,551,680, or 14.1%, had completed four years of high school, and an additional 15.0% had had one, two or three years of high school; 3,407,331, or 4.6%, had completed four years (or more) in college, and an additional 5.4% had had one, two or three years of college.

Figures representing the median number of years of school completed are presented in Table XXIII. The median, as defined above in connection with the age classification, is that value in a series of values arranged in ascending or descending order, which stands in the middle of the series, so that one-half of the items are greater than the median and one-half less. In order to understand clearly the relation between the medians and the frequency distribution presented in the table, it is necessary to keep in mind the fact that the distribution is in terms of completed years, while the medians are expressed in decimals representing tenths of a year. For example, the number of persons shown as having completed eight years of school includes not only those who had completed exactly eight years but also all those who had completed in addition any fraction of a year. In other words, the range of the group is from 8 to 8.9 years. A median of 8.4, then, does not indicate a point beyond the limits of the eight-year group but rather a position within that group.

The median number of years of school completed by all persons 25 years old and over in the United States in 1940 was 8.4. Because of the more favourable educational opportunities in urban areas, the median number of years of school completed was decidedly higher for the urban population 25 years old and over than for either of the rural groups, being 8.7 for the urban, as compared with 8.4 for the rural-nonfarm or village population and only 7.7 for the rural-farm. There were similar differentials as between one and another of the race-nativity classes, the medians ranging from 8.8 for the native whites to 5.7 for the Negroes—or combining the two classifications, from 9.6 for the urban native whites to 4.1 for the rural-farm Negroes.

Marital Status.—World War II produced a remarkable increase in the percentage of men and women who were married, according to a sample survey completed in Feb. 1944. The increase resulted mainly from the large numbers of war marriages among young people, but all age groups of the population contributed somewhat to the upward matrimonial trend. The proportion of married persons in the population was higher in 1944 than at any

Table XXIII.—Persons 25 Years Old and Over by Years of School Completed, for the United States, Urban and Rural, 1940

	United Sta	tes	Urban		Rural-noni	Farm	Rural-farm		
		Per		Per		Per		Per	
Years of school completed	Number	cent	Number	cent	Number	cent	Number	cent	
Persons 25 and over	74,775,836	100.0	45,229,242	100.0	14,753,758	100.0	14,792,836	100.0	
No school years completed	2,799,923 7,304,689 8,515,111 25,897,953 11,181,995 10,551,680 4,075,184 3,407,331	3.7 9.8 11.4 34.6 15.0 14.1 5.4 4.6 1.4	1,606,239 3,471,964 4,464,991 15,064,102 7,186,008 7,524,619 2,733,837 2,585,591 591,891	3.6 7.7 9.9 33.3 15.9 16.6 6.0 5.7 1.3	500,352 1,511,983 1,755,199 5,112,884 2,243,088 1,909,256 838,186 625,300 257,510	3.4 10.2 11.9 34.7 15.2 12.9 5.7 4.2 1.7	693,332 2,320,742 2,294,921 5,720,967 1,752,899 1,117,805 503,161 196,440 192,569	4.7 15.7 15.5 38.7 11.8 7.6 3.4 1.3	
Not reported	1,041,970	1.4	391,891	1.3	237,310	1.7	192,309	1.3	
Median school years completed: All classes (as above) Native white Foreign-born white Negro Other races	8.4 8.8 7.3 5.7 6.8	=	8.7 9.6 7.4 6.8 7.9	=	8.4 8.6 7.3 5.0 6.7	=	7.7 8.0 7.2 4.1 5.4	=	

previous time for which statistics were available.

In Feb. 1944 there were 32,850,000 married women in the United States, representing nearly 63% of the female population 14 years old and over, as shown in Table XXIV. In 1940, the decennial census showed that only 30,090,488, or 60% of the female population 14 years old and over, were married. The unusual character of this increase is shown by the fact that in the decades 1930-40 and 1920-30 the percentage of

women married changed by only a fraction of 1%. The increase in 1940 was without doubt attributable mainly to the psychological effects of war conditions and to a new sense of economic security resulting from full employment and high wartime wages.

Among civilian men, the proportion married was even larger than among women because a large percentage of the unmarried men were in the armed forces in 1944. Of the males 14 years old and over who were civilians in 1944, 72% were married. The combined effect of inductions and the increase in marriages is shown by the figures for men 20 to 34 years old. In Feb. 1944, there were only 1,700,000 civilian bachelors in this age group, as compared with 7,100,000 single men in 1940. The induction of young men into the armed forces, at least up to 1944, had not discouraged young people from marrying.

The greatest increase in the proportion of the female population married occurred among women in their early twenties. In Feb. 1944, nearly six-tenths of the civilian women 20 to 24 years old were married, as compared with five-tenths in 1940. A marked increase also occurred among women 25 to 34, though the change was less evident among older women. The extent to which war conditions necessitated temporary separation of married couples is shown by the figures for married women classified according to whether their husbands were present (that is, were living in the same household) at the time of the survey. There were more than 2,700,000 married women whose husbands were absent in the armed forces in 1944, representing about 8% of the total number of civilian married women. In the age group 20 to 24 years, nearly 30% of the married women were wives of absent servicemen. The number of married women with husbands absent otherwise than in the armed forces in 1944 was 1,460,000-not far different from the whole number of married women with husbands absent as returned in the census of 1940. (See also Marriage and Divorce.)

Fertility.—One of the new features of the reports of the 1940 census of population comprised two elaborate tabulations of data on fertility. One of these tabulations was based on the number of children ever born, as reported for each woman in 1940, and the second was based on the number of children under five years of age, as returned in the regular enumeration of the population. Parallel tabulations were made from the schedules of the 1910 census in order to provide significant comparisons for dates about a generation apart. A summary of the data for native white women either married, widowed or divorced at the time of the census (often referred to as "ever-married" women) is presented in Table XXV.

	(Data for 1944 based on a small sample)									
Year, sex and	Total, 14	14 to 19	20 to 24	25 to 34	35 to 44	45 to 64	65 years			
marital status	and over	years	years	years	years	years	and over			
Male, 1944	41,260,000 9,320,000 29,690,000 2,250,000	5,480,000 5,400,000 80,000	1,580,000 850,000 730,000	6,920,000 850,000 6,000,000 70,000	8,870,000 840,000 7,830,000 200,000	13,800,000 1,100,000 11,840,000 860,000	4,610,000 280,000 3,210,000 1,120,000			
Male, 1940	50,553,748	7,398,269	5,692,392	10,520,974	9,164,794	13,371,199	4,406,120			
	17,593,379	7,289,949	4,109,304	3,014,317	1,283,994	1,462,174	433,641			
	30,192,334	106,182	1,557,104	7,329,866	7,551,974	10,836,381	2,810,827			
	2,768,035	2,138	25,984	176,791	328,826	1,072,644	1,161,652			
Female, 1944	52,300,000 12,630,000 32,850,000 28,630,000 4,220,000 2,760,000 1,460,000 6,820,000	6,960,000 6,150,000 790,000 430,000 360,000 330,000 20,000	5,980,000 2,440,000 3,470,000 2,310,000 1,160,000 1,020,000 140,000 70,000	10,900,000 1,640,000 8,910,000 7,430,000 1,480,000 350,000 350,000	9,870,000 1,040,000 8,090,000 7,490,000 600,000 240,000 360,000 740,000	13,620,000 1,010,000 9,820,000 9,310,000 510,000 40,000 470,000 2,790,000	4,970,000 350,000 1,770,000 1,660,000 110,000 2,850,000			
Female, 1940	50,549,176	7,340,984	5,895,443	10,818,052	9,168,426	12,713,077	4,613,194			
	13,935,866	6,608,117	2,781,001	2,049,790	950,876	1,116,719	429,363			
	30,090,488	717,293	3,025,923	8,341,197	7,430,791	8,991,382	1,583,902			
	28,516,937	655,681	2,850,306	7,933,145	7,059,543	8,542,116	1,476,146			
	1,573,551	61,612	175,617	408,052	371,248	449,266	107,756			
	6,522,822	15,574	88,519	427,065	786,759	2,604,976	2,599,929			

Two significant comparisons may be made on the basis of the ratios between the number of children and the number of women; first, as between the two census years represented, it may be noted that the number of children per 1,000 women was very much smaller in 1940 than in 1910—428 as against 651 for all native white "ever-married" women 15 to 49 years of age. Similar differences are shown for women of the various age groups making up this total, the decrease in the ratio being somewhat larger for the older women in the group.

Another significant comparison is that between the figures for urban and rural areas. The number of children per 1,000 women in urban areas in 1940 was only 351, as compared with 584 for rural-farm areas and 489 for rural-nonfarm. The decrease between 1910 and 1940 in these areas was approximately the same as that already indicated for the total, namely, a decline of 30% or 35% in the number of children per 1,000 women during the intervening 30 years.

On the basis mainly of the returns for the number of women of child-bearing age and the number of their children under 5 years old, it was figured out that if the birth and death rates of the period 1935-40 were to continue indefinitely, there would be 978 daughters born per generation for every 1,000 women born during the preceding generation. The figure 978 is termed the net reproduction rate. The corresponding net reproduction rate for the period 1905-10 was 1,336. This rate is a useful device for summarizing in a single figure the prospects of immediate future population growth in a country or section or a class of the population. A net reproduction rate of 1,000 would indicate that each generation would just replace itself under the stated conditions. A lower rate implies a declining population and a higher rate a potentially gaining population. Net reproduction rates for the urban and rural population, by regions, for five-year periods ending in 1940 and 1910, are presented in Table XXVI. If a rate were computed for 1945 it would be appreciably above 1,000, by reason of increases in the birth rate, though it was not expected in late 1946 that this higher level would be maintained for a very long period.

These figures indicate in more dramatic fashion than the percentages of Table XXV the marked decline in fertility rates between 1910 and 1940 and the difference on either date between urban and rural areas. They indicate that even in 1910 the urban population was not quite reproducing itself, while the rural-farm areas still had, even in 1940, a considerable excess capacity for population increase. It is evident from these figures that the

Table XXV.—Fertility of Native White Women as Measured by Number of Children Under 5 Years of Age, 1940 and 1910

(Basic figures represent all native white women within the specified age range who were or had been married at the time of the census)

		1940			1910	
		Children	under		Children	under
	Number of	5 years o		Number of	5 years o	
	ever-	0 /04.50	Per	ever-	0 /04.5	Per
	married		1.000	married		1,000
Age of woman and area	women	Number	women	women	Number	women
	WOINER	Montper	WOINER	WOMEN	HOMBE	WOIIIGH
UNITED STATES						
Total, 15 to 49 years	19,506,960	8,357,920	428	10,516,662	6,844,144	651
15 to 19 years	598,060	275,080	460	395,633	188,633	477
20 to 24 years	2,653,920	1,974,580	744	1,597,060	1,453,810	910
25 to 29 years	3,673,880	2,594,320	706	2,034,434	1,980,255	973
30 to 34 years	3,621,640	1,874,620	518	1,927,998	1,528,767	793
35 to 39 years	3,295,040	1,060,900	322	1,818,648	1,081,234	595
40 to 44 years	2,970,720	464,440	156	1,489,229	498.783	335
45 to 40 years	2,693,700	113,980	42	1,253,660		90
45 to 49 years	2,073,700	113,700	44	1,233,000	112,662	90
URBAN						
Total, 15 to 49 years	11,240,340	3,945,820	351	4,626,910	2,246,597	486
15 to 19 years	252,600	101,580	402	116,927	48,028	411
20 to 24 years	1,462,800	911,100	623	639,858	468.103	732
25 to 29 years	2,160,680	1,302,840	603	904,378	695,056	769
20 to 24 years	2,145,940	940,900	438			596
30 to 34 years	1,926,720		244	877,552	522,740	
35 to 39 years		470,620		831,810	340,773	410
40 to 44 years	1,740,520	180,680	104	683,364	142,759	209
45 to 49 years	1,551,080	38,100	25	<i>5</i> 73,021	29,138	51
RURAL-NONFARM						
Total, 15 to 49 years	4,385,520	2,143,820	489	2,521,703	1.769.825	702
15 to 19 years	169,140	87,020	514	126,493	62,872	497
20 to 24 years	661,080	558,300	845	440,570	429,008	974
25 to 29 years	858,340	664,000	774	511,118	526,598	1,030
30 to 34 years	830,220	460,880	555	455.298	374,728	823
35 to 39 years	721,480	249,680	346	404.973	248,954	615
	610,400		166			
40 to 44 years		101,280		317,708	104,634	329
45 to 49 years	534,860	22,660	42	265,543	23,031	87
RURAL-FARM						
Total, 15 to 49 years	3,881,100	2,268,280	584	3,368,049	2,827,722	840
15 to 19 years	176,320	86.480	490	152.213	77,733	511
20 to 24 years	530,040	505,180	953	516,632	556,699	1,078
25 to 29 years	654,860	627,480	958	618,938	758,601	1,226
30 to 34 years	645,480	472,840	733	595.148	631,299	1,061
35 to 39 years	646,840	340,600	527	581,865	491,507	845
	619,800	182,480	294	488.157		
40 to 44 years					251,390	515
45 to 49 years	607,760	53,220	88	415,096	60,493	146

Table XXVI.—Net Reproduction Rates for the United States by Regions, Urban and Rural, 1935–40 and 1905–10 (Rates represent number of daughters born during one generation per 1,000 women born during preceding generation)

	United	United States		Urban		nonfarm	Rural-farm	
	1935	1905	1935	1905	1935	1905	1935	1905
	to	to	to	to	to	to	to	to
Агеа	1940	1910	1940	1910	1940	1910	1940	1910
United States	978	1,336	726	937	1,150	1,499	1,661	2,022
Northeastern states	794	1,120	<i>7</i> 15	1,033	1,035	1,426	1,406	1,439
North Central states	944	1,308	753	963	1,146	1,451	1,452	1,834
South	1,182	1,614	712	764	1,211	1,591	1.812	2.199
West	941	1,166	726	807	1.174	1,459	1.559	1.848

Table XXVII.—Employment Status of the Civilian Population of the United States, 1940 to 1946 (Figures represent persons 14 years old and over, excluding institutional population as well as persons in the armed forces)

Civilian labour fo

			Civilian labour	torce			
			Employed		Unemp	loyed	Persons
Sex and date BOTH SEXES	Total	Total	In agri- culture	In non- agricultural occupations	Number	Per cent of labour force	not in labour force
Old series:				•			
July 1940	56,420,000 56,550,000 56,770,000 56,040,000 55,000,000 53,750,000	48,010,000 51,310,000 54,340,000 54,750,000 54,000,000 52,660,000	10,660,000 9,930,000 10,000,000 9,700,000 9,670,000 9,140,000	37,350,000 41,380,000 44,340,000 45,050,000 44,330,000 43,520,000	8,410,000 5,240,000 2,430,000 1,290,000 1,000,000 1,090,000	14.9 9.3 4.3 2.3 1.8 2.0	43,530,000 43,210,000 41,910,000 38,320,000 37,980,000 39,360,000
New series:* July 1945	55,220,000 60,400,000	54,270,000 58,130,000	9,840,000 9,940,000	44,430,000 48,190,000	950,000 2,270,000	1. 7 3.8	37,890,000 43,320,000
Old series: July 1940	42,570,000 42,150,000 41,220,000 37,380,000 35,890,000 34,940,000	36,680,000 38,570,000 39,710,000 36,670,000 35,410,000 34,380,000	9,410,000 8,470,000 8,200,000 7,620,000 7,520,000 7,030,000	27,270,000 30,100,000 31,510,000 29,050,000 27,890,000 27,350,000	5,890,000 3,580,000 1,510,000 710,000 480,000 560,000	13.8 8.5 3.7 1.9 1.3 1.6	7,050,000 6,650,000 5,910,000 4,970,000 4,640,000 5,170,000
New series:* July 1945	35,140,000 43,000,000	34,660,000 41,240,000	7,130,000 7,780,000	27,530,000 33,460,000	480,000 1,760,000	1.4 4.1	4,970,000 6,950,000
FEMALE							
Old series: July 1940	13,850,000 14,400,000 15,550,000 18,660,000 19,110,000 18,810,000	11,330,000 12,740,000 14,630,000 18,080,000 18,590,000 18,280,000	1,250,000 1,460,000 1,800,000 2,080,000 2,150,000 2,110,000	10,080,000 11,280,000 12,830,000 16,000,000 16,440,000 16,170,000	2,520,000 1,660,000 920,000 580,000 520,000 530,000	18.2 11.5 5.9 3.1 2.7 2.8	36,480,000 36,560,000 36,000,000 33,350,000 33,340,000 34,190,000
New series:* July 1945	20,080,000 17,400,000 ent the results o	19,610,000 16,890,000 f an improved t	2,710,000 2,160,000 technique of en	16,900,000 14,730,000	470,000 510,000	2.3 2.9	32,920,000 36,370,000

*The new series figures represent the results of an improved technique of enumeration which gave a slightly larger labour force the additions being mainly women; adjusted data for the earlier dates were being prepared in 1946.

rapid growth of the urban population had depended on an extensive in-migration from rural areas; and it was equally evident, from a study of economic developments in the farming areas, that these latter had had a surplus of sons and daughters whom they did not need for the maintenance of agricultural production-and that the occupational opportunities offered these boys and girls in the industrial centres constituted a real benefit to the rural areas.

The rates shown for the four geographic regions indicate variation in fertility on a different basis. For the south alone, among the four regions, the 1940 net reproduction rate of 1,182 indicates a potentially increasing population, while the very low rate of 794 for the north-eastern states indicates a population far short of maintaining its own numbers. (See also Birth Statistics.)

Employment and Labour Force.-On the basis of data obtained each month from a representative sample of 25,000 or 30,000 households, monthly estimates were published beginning in March 1940, giving the number of persons in the civilian labour force, the number employed (with separate figures for those in agricultural and those in nonagricultural occupations) and the number unemployed. These figures are summarized for the month of July, from 1940 to 1946, in Table XXVII. The month of July, it may be noted, represents the peak in the seasonal variation in the number of persons in the labour force, it being a month of active employment in agriculture and also a month in which many young persons were working during school vacation.

The effects of the induction of men into military service, and the effects of their partial replacement by women, are clearly in-

dicated by the figures shown for the civilian labour force. The number of males in the civilian labour force in July 1940 was 42,570,000; this number had declined by July 1945 to 34,950,000, but then increased, with the return of millions of service men to civilian life, to 43,000,000 in July 1946.

The number of females in the labour force, on the other hand, increased from 13,850,000 in July 1940 to a maximum of 19,110,000 in July 1944, with a slight decrease recorded in July 1945, and a decided decrease to 17,400,000, in July 1946. (The actual decrease in the number of women in the labour market between 1944 and 1946 was even more than the difference between these two figures would indicate, since the 1946 figure represented the results of a new enumerative technique which brought more than 1,000,000 additional women into the labour force classification.)

The gradual disappearance of unemployment is likewise indicated by these representative monthly figures. In July 1940, 14.9% of the labour force was unemployed (including those on emergency work); by July 1941 this percentage had been reduced to 9.3; by July 1942 to 4.3; and by July 1944 to 1.8, which last figure may be assumed to represent approximately the minimum number of persons who would in July of any year be in process of passing from one job to another—so-called "frictional" unemployment.

During the next year, with the return of millions of veterans from overseas and their placement in civilian employment, the number of unemployed, that is, the number of persons actually seeking work, increased materially to a total of 2,270,000, or 3.8% of the labour force, in July 1946. This figure, it may be noted, was far short of the amount of unemployment which was forecast at the close of hostilities by those looking forward to the end of the first postwar year. Practically all of the increase in unemployment took place in the male labour force, where the number increased from 480,000, or 1.4% in July 1945 to 1,760,000, or 4.1% in July 1946, while the increase in female unemployment was only from 470,000 to 510,000.

The number of persons employed in agriculture declined from 10,660,000 in July 1940 to 9,140,000 in July 1945. This net loss of 1,520,000 resulted from a decline of 2,380,000 in the number of males employed in agriculture, partly offset by an increase of 860,000 in the number of females so employed. By the end of the first postwar year, in July 1946 the number of males employed in agriculture had increased by around 600,000 to 7,780,000, and the number of females had declined materially.

The number of persons employed in nonagricultural occupations increased from 37,350,000 in July 1940, to a wartime maximum of 45,050,000 in 1943 and stood at 43,-

520,000 in July 1945. With the return of men from military service, however, the number of nonagricultural workers increased to 48,190,000 in July 1946. The number of females employed in nonagricultural occupations was 10,080,000 in July 1940, and 16,170,000 in 1945, the increase in this number thus accounting for practically all of the increase in the whole

number of nonagricultural workers. Between 1945 and 1946, however, the number of female workers in nonagricultural occupations decreased by more than 2,000,000, this figure being made up largely by housewives who were withdrawing from gainful activity undertaken under stress of wartime demands.

Later changes in employment and the labour force, including the seasonal fluctuations, are indicated by the figures in Table XXVIII, which presents data month by month from July 1945 to Aug. 1946. The first column of this table provides a measure of the civilian labour force, declining in the first few months of the period, partly as a result of the decline in war activity and partly because of the normal seasonal change from midsummer to midwinter, and then picking up rapidly in the second half of the period, with the return of servicemen, the reconversion of industry to peacetime production, and the upward seasonal trend between winter and summer.

The changes in the number of employed persons ran closely parallel with the changes in the total labour force, since the increases in unemployment were at no time spectacular. The maximum number of unemployed males, 2,200,000, was recorded in March 1946, followed by a decline to 1,580,000 in August. The number of unemployed females remained close to 500,000 throughout the period, while the number of employed females decreased from 19,610,000 in July 1945 to 16,710,000 in Aug. 1946, mainly because of the withdrawals from industrial activity already mentioned. (See also Employment.)

Wage or Salary Income.—The 1940 population census included two questions on income which applied to all persons 14 years old and over except inmates of specified institutions. The main question called for the amount of money wage or salary income received in 1939. This was supplemented by a second question which asked whether or not income amounting to \$50 or more was received in 1939 from sources other than money wages or salaries. The purpose of the second question was to identify for separate tabulation those for whom wages or salaries constituted practically the entire income.

The income question was limited to wages and salaries in order to simplify the work of the enumerator, it being assumed that the information could be obtained much more readily than information on farm income, business profits, or receipts from other sources.

Wage or salary income was defined as including all money received in compensation for work or services performed as an employee, including commissions, tips, piecerate payments, bonuses, etc., as well as those receipts commonly referred to as wages or salaries. The value of income received in kind, such as living quarters, meals, clothing, etc., was not included.

The most significant of the returns from the income questions were those relating to persons classified as wage

Table XXVIII.—Civilian Labour Force, Unemployed and Employed—Monthly Data, July 1945 to Aug. 1946 (Thousands of persons 14 years old and over, excluding institutional population as well as persons in armed forces)

						Both sexes			Male			Female	
	Mo	nth			Civilian Iabour force	Employed	Unem- ployed	Civilian Iabour force	Employed	Unem- ployed	Civilian Iabour force	Employed	Unem - ployed
July	1945		 		55,220	54,270	950	35,140	34.660	480	20,080	19.610	470
Aug.	1945		 		54.350	53.520	830	35,020	34,590	430	19,330	18,930	400
Sept.	1945				52,900	51,250	1.650	34,250	33,320	930	18,650	17.930	720
Oct.	1945				53,110	51,560	1,550	34,590	33,660	930	18,520	17,900	620
Nov.	1945				53,440	51,730	1,710	35.280	34,100	1,180	18,160	17,630	530
Dec.	1945				53,310	51,360	1,950	36,130	34.650	1,480	17,180	16,710	
Jan.	1946				53.710	51,420	2,290	37,550	35,790	1,760	16,160	15,630	470
Feb.	1946				54,340	51,690	2,650	38,340	36,200	2,140	16,000	15,490	530 510
March	1946				55,660	52,950	2,710	39,370	37,170	2,200	16,290	15,780	510
April	1946				56,900	54,550	2,350	40,310	38,420	1,890	16,590		
May	1946				57,630	55,320	2,310	40,950	39,060	1,890	16,680	16,130	460
June	1946	٠			59,300	56,740	2,560	42,030	40,030	2,000	17,270	16,260	420
July	1946				60,400	58,130	2,270	43,000	41,240	1,760		16,710	560
Aug.	1946				60,000	57,960	2,040	42,830	41,250	1,580	17,400 17,170	16,890 16,710	510 460

or salary workers, omitting those on public emergency work. Income data for this class, which formed nearly three-fourths of the entire labour force, are presented in Table XXIX. Wage or salary workers were defined as persons who in their current or last job worked as employees for wages or salaries.

About two-fifths of the workers who reported the receipt of no money wage or salary income in 1939 were persons who reported the receipt of other income and thus might have received all their income in 1939 from farming or other own-account activities, and the remainder were for the most part persons who were unemployed or outside the labour force in 1939.

The considerable range of income was indicated by the fact that about one-fourth (30.8% of the males

and 8.8% of the females) reported incomes of \$1,400 or more and a little more than one-fourth (23.5% of the males and 40.5% of the females) reported incomes below \$400. Those who received \$5,000 and over constituted 1.0% of the total and those with from \$1 to \$99, 3.4%.

In the group of workers without other income of \$50 or more, the median wage or salary income of those workers who received \$1 or more in 1939 was \$1,046 for men and \$621 for women. These figures apply to all wage or salary workers without regard to occupation or amount of time worked, so they can not by any means be used as an indication of differences in pay scales for men and women doing the same work.

Those persons who were wage or salary workers in March 1940, but who reported that they received no wage income in 1939 and who were for this reason omitted in the computation of the medians quoted above, were largely persons who did not begin work until 1940 or who were unemployed or working on their own account (not for wages or salary) during the whole of 1939.

The median wage or salary income of male workers who did have income from nonwage sources amounting to \$50 or more was \$972, and for female workers, \$516, these figures being materially less than the median incomes of those for whom wages or salary constituted practically the entire income. For persons at the lower end of the wage or salary income scale, nonwage income, consisted primarily of direct relief payments and of income in kind, such as food, clothing and lodging, whereas for persons at the upper end of the scale it consisted mainly of rents, interest, dividends and profits. (See also Wages and Hours.)

Families.—A family, as the term is ordinarily used in the census reports, comprises a family head and all other persons in the home related to the head by blood, marriage or adoption. A person living alone is counted as a oneperson family.

Table XXIX.—Wage or Salary Income in 1939 for Males and Females Who Were Wage or Salary Workers in March, 1940

	Total	Without other Total income			With other income*		
Wage or salary income	, Oldi	Per	mcome	Per	com	Per	
in 1939, and sex	Number	cent	Number	cent	Number	cent	
Males reporting income	26,846,220	100.0	22,342,980	100.0	4,503,240	100.0	
None \$1 to \$99 \$100 to \$199 \$200 to \$399 \$400 to \$599 \$600 to \$799 \$800 to \$999 \$1,000 to \$1,399 \$1,400 to \$1,399 \$1,400 to \$1,599 \$1,600 to \$1,799 \$1,600 to \$1,799 \$2,000 to \$2,479 \$2,500 to \$2,999 \$3,000 to \$2,999 \$3,000 to \$2,999	1,662,340 606,340 1,235,580 2,783,960 2,460,600 2,690,840 2,368,520 2,436,660 2,011,720 1,316,020 1,316,020 1,316,020 1,316,020 1,316,020 1,316,020 1,316,020 1,316,020 1,316,020	6.2 2.3 4.6 10.4 9.2 10.0 8.8 9.1 7.5 4.9 7.0 2.7 2.5	932,940 492,960 1,013,060 2,258,680 2,060,560 2,320,320 2,071,580 2,099,260 2,151,020 1,778,980 981,560 1,142,640 1,604,020 594,240 515,340	4.2 2.2 4.5 10.1 9.2 10.4 9.3 9.6 8.0 4.4 5.1 7.2 2.7 2.3	729,400 113,380 222,520 525,280 400,040 370,520 296,920 269,060 285,640 134,160 173,380 270,140 123,160 149,340	16.2 2.5 4.9 11.7 8.9 8.2 6.6 6.3 5.2 3.0 3.9 6.0 2.7 3.3	
\$4,000 to \$4,999	190,460 342,920	0.7 1.3	135,660 190,160	0.6	54,800 1 <i>52,76</i> 0	1.2 3.4	
Females reporting income	10,589,520	100.0	9,066,540	100.0	1,522,980	100.0	
None	1,011,100 670,940 967,940 1,646,880 1,428,780 1,551,040 1,104,340 543,160 326,520 158,140 147,320 165,760 54,120 48,360 10,240 13,080	9.5 6.3 9.1 15.6 13.5 10.4 7.0 5.1 3.1 1.5 0.5 0.5 0.1	658,780 572,140 824,100 1,403,740 1,256,400 1,402,360 1,006,160 680,140 488,960 288,320 136,140 123,740 134,020 41,320 35,160 6,740 8,320	7.3 6.3 9.1 15.5 13.9 15.5 11.1 7.5 5.4 3.2 1.5 0.5 0.1 0.1	352,320 98,800 143,840 243,140 172,380 148,680 98,180 61,660 54,200 22,000 23,580 31,740 12,800 13,200 3,500 4,760	23.1 6.5 9.4 16.0 11.3 9.8 6.4 4.0 3.6 2.5 1.4 1.5 2.1 0.8 0.9 0.2	
Median wage or salary income for workers with \$1 or more	\$877	_	\$885		\$817	_	
Male	1,038 610		1,046 621	_	972 516	_	

*Includes workers not reporting whether or not they received other income of \$50 or more—about 800,000 in all.

The number of families in the United States in 1940 was 35,087,440. This number included 26,605,800 "normal" families (families having as head a married man, wife present); 3,128,400 other families with a male head and 5,353,240 families with a female head. In 1945, according to a survey completed in May, there were 37,450,000 families, or about 2,363,000 more than in 1940. The number of normal families was practically the same; the number of other families with a male head had decreased to 2,630,000; while the number of families with a female head had increased to 8,200,000, or nearly 2,850,000 more than in 1940. Since this increase was approximately the same as the number of married women with husband in the armed forces, it may be assumed that the group was made up largely of families in which the wives of servicemen assumed responsibility for the home (see Table XXX).

Table XXX.—Number of Families in the United States, by Marital Status and Sex of Head, 1945 and 1940 (The figures for 1945 are estimates based on a small sample)

Sex and marital	Number o	of families	Per cent of `	Per cent of total		
status of head	May 1945	April 1940	increase	1945	1940	
All families	37,450,000	35,087,440	6.7	100.0	100.0	
Male head	29,250,000	29,734,200	-1.6	78.1	84.7	
Married, wife present	26,620,000	26,605,800	0.1	71.1	75.8	
Other marital status .	2,630,000	3,128,400	-15.9	7.0	8.9	
Female head	8.200.000	5.353.240	53.2	21.9	15.3	

The changes in the distribution of families by size between 1940 and 1945 are indicated by the figures in Table XXXI. The average number of persons per family was only 3.21 in 1945, as compared with 3.52 in 1940, the decrease resulting in large part from the absence of one-time family members in military service in 1945, though in accordance with a long-time trend the average size of family in the United States had been decreasing at the rate of about two-tenths of a person in each decade. There were more 2-person families in the United States than families of any other size both in 1945 and in 1940 although the percentage of such families in the total had

increased in the 5-year period from 25.7% to 29.2%. The percentage of 1-person families likewise increased materially, while the number of families comprising 5 or more persons decreased by 17.4%.

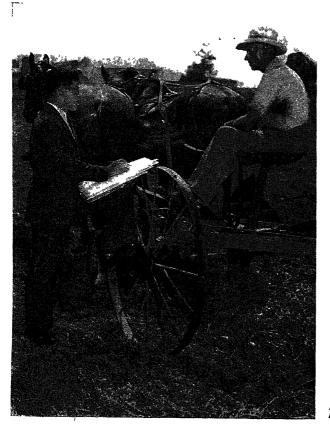
Table XXXI.—Number of Families in the United States, by Size, 1945 and 1940 (The figures for 1945 are estimates based on a small sample)

	Number of families		Per cent of	Per cent of total			
Size of family	May 1945	April 1940	increase	1945	1940		
_ All families		35,087,440	6.7	100.0	100.0		
One person	4,740,000	3,497,200	35.5	12.7	10.0		
Two persons		9,012,700	21.4 7.5	29.2 22.1	25.7 22.0		
Three persons Four persons	8,290,000 6,290,000	7,709,840 6,164,000	2.0	16.8	17.6		
Five persons		3,749,460	-7.5	9.3	10.7		
Six persons	1,850,000	2,171,540	-14.8	4.9	6.2		
Seven or more persons .	1,870,000	2,782,700	-32.8	5.0	7.9		

Housing Data.—The number of occupied dwelling units in the United States increased from 34,855,000 in 1940 to 37,600,000 in Nov. 1945, the increase amounting to 2,745,000. Urban dwelling units alone increased by 3,151,000, or more than the increase in the total, this figure being partly offset by a decrease of 788,000 in rural-farm dwelling units, while rural-nonfarm units showed a moderate increase of 382,000.

Tenure.—One of the most significant changes in the characteristics of dwelling units between these two dates was the marked increase in the percentage of units occupied by their owners. There was a decrease of 2,068,000 in the number of tenant-occupied units, and an increase of 4,813,000 in owner-occupied units, this change resulting in part without doubt from the regulations with respect to the amount of rent that might be charged. The percentage owner-occupied for all dwelling units thus increased from 43.6% in 1940 to 53.2% in 1945.

Rural visit by a U.S. census taker in connection with the 16th decennial census of 1940



For dwelling units in urban areas the increase was from 37.5% to 46.5%; in rural-nonfarm areas from 51.7% to 64.1%; in rural-farm areas from 53.2% to 65.4%—though in this last case, by reason of the very considerable decrease in the whole number of occupied units, the 1945 percentage applied to a different and appreciably smaller base. The data on dwelling units by tenure are summarized in Table XXXII.

Table XXXII.—Occupied Dwelling Units in the United States by Tenure, 1945 and 1940

(Data for 1945 based on a small sample.

A minus sign [—] denotes decrease)

	Estimated	number of	increa	Per cent of		
	occupie	ed units		Per	to	tal
Area and tenure	1945	1940	Number	cent	1945	1940
United States total		34,855,000	2,745,000	7.9	100.0	100.0
Urban	23,748,000	20,597,000	3,151,000	15.3	63,2	59.1
Rural-nonfarm	7,533,000	7,151,000	382,000	5.3	20,0	20.5
Rural-farm	6,319,000	7,107,000	-788,000	-11.1	16.8	20.4
Owner-occupied	20,009,000	15,196,000	4,813,000	31.7	53,2	43.6
Tenant-occupied	17,591,000	19,659,000	-2,068,000	-10.5	46.8	56.4
Urban, total	23,748,000	20,597,000	3,151,000	15.3	100.0	100.0
Owner-occupied	11,047,000	7,715,000	3,332,000	43.2	46.5	37.5
Tenant-occupied	12,701,000	12,882,000	-181,000	-1.4	53.5	62.5
Rural-nonfarm, tota	7,533,000	7,151,000	382,000	5.3	100.0	100.0
Owner-occupied	4,831,000	3,698,000	1,133,000	30.6	64.1	51.7
Tenant-occupied	2,702,000	3,453,000	-751,000	-21.7	35,9	48,3
Rural-farm, total .	6,319,000	7.107.000	-788,000	-11.1	100.0	100.0
Owner-occupied	4,131,000	3.783.000	348,000	9.2	65,4	53.2
Tenant-occupied	2,188,000	3,324,000	-1,136,000	-34.2	34.6	46.8

Value and Monthly Rent.—In the 1940 census, the enumerator was instructed to obtain for each owner-occupied dwelling unit the estimated current market value of the home, and for each tenant-occupied unit, the monthly rent, or, if no rent was actually paid, the estimated monthly rental value. The numbers of dwelling units in the United States classified on the basis of these returns are presented in Table XXXIII, with medians, averages and percentages for rural and urban areas. The medians are in all cases materially lower than the averages, since the latter are pushed upward by the weight of small numbers of homes with very high values, while in the computation of the median a home valued at \$20,000 or more has no more weight than one valued at \$200.

In the United States as a whole, the owner-occupied dwelling units were rather widely distributed on the basis

Table XXXIII.—Dwelling Units Classified by Value or Monthly Rent, With Percentages and Averages for Urban and Rural Areas, 1940

	United S		Per cent, average					
	total		and median					
Value or rent		Per cent		Rural-	Rural-			
	Number	of total	Urban	nonfarm	farm			
Owner-occupied units reporting								
value	14,295,919	100.0	100.0	100.0	100.0			
Less than \$300	964,671	6.7	1.5	9.7	15.3			
\$300 to \$499	700,943	4.9	1.4	6.7	10.8			
\$500 to \$699	870,209	6.1	2.2	8.4	12.2			
\$700 to \$999	840,069	5.9	2.8	7.8	10.8			
£1 £00 + £1 000	1,533,550	10.7	6.9	13.1	16.8			
\$2.000 to \$2.400	1,273,188	8.9	8.0	9.9	9.8			
£0.500 + £0.000	1,281,936 1,043,481	9.0	9.5	8.8	8.1			
\$2,500 to \$2,999	1,896,760	7.3 13.3	8.8	6.9	4.3			
\$4,000 to \$4,999	1,224,898	8.6	17.8 12.5	10.9	5.7			
\$5,000 to \$5,999	913,992	6.4	9.5	6.0	2.5			
\$6,000 to \$7,499	774,958	5.4	8.4	4.4 3.3	1.7			
\$7,500 to \$9,999	464,935	3.3	5.2	1.9	0.5			
\$10,000 to \$14,999	313,090	2.2	3.4	1.4	0.3			
\$15,000 to \$19,999	101,835	0.7	1.1	0.5	0.1			
\$20,000 or more	97,404	0.7	1.0	0.5	0.1			
Average value (dollars)	3,073	-	4,131	2,408	1.419			
Median value (dollars)	2,377		3,501	1,715	1,028			
Tenant-occupied units reporting			•	.,	.,			
rent	19,223,611	100.0	100.0	100.0	100.0			
Less than \$3	985,207	5.1	0.4	7.3	22.5			
\$3 to \$4 · · · ·	1,351,813	7.0	1.5	11.5	25.1			
\$5 to \$6	1,617,189	8.4	3.3	16.5	21.1			
\$7 to \$9	1,215,598	6.3	4.3	12.3	8.3			
616 (610	2,680,423	13.9	12.3	20.8	13.2			
\$20 to \$2.1	2,364,965	12.3	14.1	12.3	4.8			
\$25 to \$29	2,084,888 1,878,431	10.8	13.9	7.0	2.4			
\$30 to \$39	2,549,719	9.8 13.3	13.0	5.2	1.3			
\$40 to \$49	1,307,595	6.8	18.6	4.2	0.8			
\$50 to \$59	575,154	3.0	9.8 4.3	1.4 0.7	0.2			
\$60 to \$74	328,621	1.7	2.5	0.7	0.2			
\$75 to \$99	165,482	0.9	1.2	0.4	0.1			
\$100 or more	118,526	0.6	0.9	0.2	_			
Average rent (dollars)	21.1 <i>7</i>	_	27.01	12.36	6.45			
Median rent (dollars)	18.22	_	24.60	10.08	4.72			

of value, all of the groups shown in the table with values up to \$7,500 being represented by approximately 5% or more of the total, the maximum group, that comprising homes valued from \$3,000 to \$3,999 containing only 13.3%. This even distribution disappears, however, when the total is subdivided into geographic areas. In fact, the subdivision of the United States into urban and rural areas covering the country as a whole results in an urban series with relatively few dwelling units valued at less than \$1,000 and appreciable numbers more than \$10,000, while in the rural-farm area almost half of the owner-occupied units were returned with a value of less than \$1,000 and two-thirds with a value of less than \$1,500. These urbanrural differentials are brought out more clearly, perhaps, by the median values, which were \$3,501 for the urban, \$1,715 for the rural-nonfarm, and \$1,028 for the rural-farm.

The range covered by the tenant-occupied dwelling units classified by rent was somewhat narrower, 60% of these units falling between \$10 and \$39 in monthly rental. Concentration in this range was especially characteristic of the urban units. The rural-nonfarm units showed a similar concentration in the rental groups from \$3 to \$20, and the rural-farm units at an even lower level. The variations in monthly rental as between urban and rural areas were decidedly greater than the corresponding variations in value, the median monthly rental for urban dwelling units being \$24.60, for rural-nonfarm units, \$10.08, and for rural-farm, \$4.72.

On the basis of the classifications presented above, the total values of all dwelling units (including tenant-occupied) and total monthly rent (including estimated rent for owner-occupied units) were computed. A summary of these estimates is presented in Table XXXIV.

The total value of all dwelling units in the United States on the basis of these estimates was more than \$95,000,000,000, and the average value per unit was \$2,557. In making these estimates, it was assumed that the value of the tenant-occupied and vacant units was 100 times the monthly rent.

The actual or estimated monthly rental value of all dwelling units in the United States in 1940 was nearly \$894,000,000, or an average of \$23.94 per unit. The annual total on this basis was something more than \$10,000,000,000. These figures are based on actual rentals reported for tenant-occupied nonfarm dwelling units, reported estimated rental values for all other dwelling units except owner-occupied farm homes, and monthly rentals for these latter estimated at the rate of 1% of the reported value.

The average value of urban dwelling units was \$3,290, as compared with \$1,055 for rural-farm units. The relation between urban and rural-farm rentals was practically the same. The average value of all dwelling units in the northeastern states was \$3,605, of those in the north central states \$2,540, of those in the south \$1,574, and of those in the west \$2,573, again with similar relations among the average monthly rentals.

Table XXXIV.—Total Value and Monthly Rental of Dwelling Units in the United States, 1940
(Figures partly estimated)

Area		Average al value value oliars) (dollars)	Total monthly rent (dollars)	Average rent (dollars)
United States	37,325,470 95,439	2.309.530 2.557	893,714,921	23.94
Urban		0.397.301 3.290	668.361.617	30.92
		7,970,612 2,017	148.565.028	18.42
Rural-nonfarm				
Rural-farm	7,042,281 8,06	0,941,617 1,055	76,788,276	10.05
Northeastern states	10.312.732 37.17	8.472.623 3.605	350.651.248	34.00
North central states		1,289,709 2,540	272.829.816	23.52
North Central states			159.288.679	14.65
South	10,870,030 17,12	0,913,670 1,574		
Wart	4.539.211 11.67	B.633.528 2.573	110,945,178	24.44

In Table XXXV, dwelling units occupied by tenants in urban and rural-nonfarm areas are classified by monthly rent as reported in 1945 and 1940. The median monthly rental of rented urban units increased from \$24.60 in 1940 to \$30.25 in 1945, the corresponding increase for units in rural-nonfarm areas being from \$10.08 to \$15.50. In the matter of distribution, these increases obviously resulted from a marked decline in the number of urban units renting for amounts less than \$25, and a marked increase in the numbers of those renting for more than \$30. In rural-nonfarm areas, the numbers of units renting for less than \$15 decreased very sharply, while the numbers renting for \$25 or more showed very large increases, amounting in the case of those with rentals between \$30 and \$50 to more than 100%. These figures are summarized in Table XXXV.

Table XXXV.—Tenant-Occupied Dwelling Units in Urban and Rural-Nonfarm Areas by Contract Monthly Rent, 1945 and 1940 he 1945 figures are based on a small sample; 1940 figures include an estimate

(The 1945 figures are based on a small sample; 1940 figures include an estimated distribution of units not reporting rent. A minus sign [-] denotes decrease)

	Estimated	Per cent of					
	un	uts	Increa	se	total		
Area and con- tractmonthly rent	1945	1940	Number	Per cent	1945	1940	
Urban, total .	12,701,000	12,882,000	-181,000	-1.4	100.0	100.0	
Under \$5 \$5 to \$9 \$10 to \$14 \$15 to \$19 \$20 to \$24 \$25 to \$29 \$30 to \$39 . \$40 to \$49 \$50 or more .	74,000 453,000 975,000 1,327,000 1,755,000 3,180,000 1,965,000 1,443,000	249,000 970,000 1,588,000 1,813,000 1,675,000 2,402,000 1,262,000 1,136,000	-175,000 -517,000 -613,000 -486,000 -258,000 80,000 778,000 703,000 307,000	-70.3 -53.3 -38.6 -26.8 -14.4 4.8 32.4 55.7 27.0	0.6 3.6 7.7 10.4 12.0 13.8 25.0 15.5 11.4	1.9 7.5 12.3 14.1 13.9 13.0 18.6 9.8 8.8	
Median monthly rent (dollars).	30.25	24.60		_	_		
Rural-nonfarm, total	2,702,000	3,453,000	-751,000	-21.7	100.0	100.0	
Under \$5 \$5 to \$9 \$10 to \$14 \$15 to \$19 \$20 to \$24 \$25 to \$29 \$30 to \$39 \$40 to \$49 \$50 or more .	177,000 538,000 543,000 463,000 283,000 224,000 308,000 101,000 65,000	651,000 992,000 717,000 425,000 244,000 179,000 144,000 48,000 53,000	-474,000 -454,000 -174,000 38,000 39,000 45,000 164,000 53,000 12,000	-72.8 -45.8 -24.3 8.9 16.0 25.1 113.9 110.4 22.6	6.6 19.9 20.1 17.1 10.5 8.3 11.4 3.7 2.4	18.9 28.7 20.8 12.3 7.1 5.2 4.2 1.4	
Median monthly? rent (dollars) .	15.50	10.08	_	_	_	_	

Plumbing Equipment.—Of the 37,600,000 occupied dwelling units in 1945, 24,385,000, or 64.9%, had a private bath and a private flush toilet, as compared with 55.7% having the same facilities in 1940. An additional 4.1% of the 1945 total had a flush toilet but no private bath, as compared with 4.3% in this group in 1940. Of the units lacking both these facilities, 3,622,000 had running water in the dwelling unit, leaving 8,057,000 without even this convenience. This last group, which was mainly rural, decreased 22.0% during the five-year period, and comprised only 21.4% of the total in 1945, as compared with 29.6% in 1940. The changes from 1940 to 1945 in urban, rural-nonfarm, and rural-farm units were all in the same direction, though at decidedly different levels. For example, 81.5% of the urban units had private bath and flush toilet (increase from 76.9%) as compared with 53.5%

of the rural-nonfarm (increase from 39.5%) and only 15.9% of the rural-farm units (increase from 10.9%). Conversely, the percentage of urban units without running water in 1945 was only 5.3% (decrease from 6.5%) as compared with 71.9% of the

rural-farm units (decrease from 81.8%). These figures are summarized in Table XXXVI.

Heat, Light and Radio. -The percentage of the whole number of occupied dwelling units in the United States provided with central heating facilities increased from 42.0% in 1940 to 48.4% in 1945; the percentage having electric lights increased in the same period from 79.2% to 88.7%, and the percentage having a radio from 82.8% to 90.4%. In the matter of central heat, the percentage reported for

urban units was far higher than that for rural-farm-61.2% as compared with 15.4%. In the matter of electric lights there were likewise material differences, although more than one-half of the rural-farm units reported electric lights in 1945 (52.4% in 1945 as compared with 32.3% in 1940). In the matter of radios, 76.6% of the rural-farm homes reported such equipment, as compared with 94.4% of the urban homes. These figures are summarized in Table XXXVII.

Table XXXVII.—Occupied Dwelling Units Having Central Heat, Electric Lights or Radio, 1945 and 1940

(The 1945 figures are based on a small sample)

ltem		United States	Urban	nonfarm	farm
Total occupied units	1945 1940	37,600,000 34,855,000	23,748,000 20,597,000	7,533,000 7,151,000	6,319,000 7,107,000
Central Heat	1945	18,188,000	14,536,000	2,679,000 1,933,000	973,000 720,000
Per cent of total .	1945 1940	48.4 42.0	61.2 58.2	35.6 27.0	15.4 10.1
Electric lights	1945 1940	33,356,000 27,604,000	23,238,000	6,805,000 5,588,000	3,313,000
Per cert of total .	1945 1940	88.7 79.2	97.9 95.7	90.3 78.1	52.4 32.3
Radio	1945 1940	33,998,000 28,847,000	22,416,000 18,925,000	6,741,000 5,645,000	4,841,000 4,277,000
Per cent of total .	1945 1940	90.4 82.8	94.4 91.9	89.5 78.9	76.6 60 . 2

Sixteenth Census Reports.-The major part of the material from the 1940 census was published in eight volumes, most of the volumes containing several parts. Each volume was made up by consolidating a series of state bulletins (in which form the data were first made public), including in each case a summary for the United States. There are four volumes presenting data specifically on population and four volumes presenting data on housing. In addition, there are available 30-odd supplementary reports, for the most part based on sample tabulations, covering subjects as follows:

Institutional population.

Internal migration 1935-40 (four reports) giving statistics on colour and sex of migrants, economic characteristics, age and social characteristics.

State of birth of the native population.
Nativity and parentage of the white population (three reports), including country of origin of the foreign stock, and mother tongue of the entire population.

Characteristics of the nonwhite population by race.

Differential fertility (four reports) presenting data for states and large cities, standardized fertility rates and reproduc-

tion rates, children ever born and children under five years old.

Educational attainment of children by rental value of home. The labour force (seven reports), presenting detailed tabulations by occupation, industry, income, personal and

		number of ed units	ase Per		cent of total	
Area and plumbing equipment	1945	1940	Number	cent	1945	1940
United States total	37,600,000 24,385,000 1,536,000 3,622,000 8,057,000	34,855,000 19,429,000 1,487,000 3,614,000 10,325,000	2,745,000 4,956,000 49,000 8,000 -2,268,000	7.9 25.5 3.3 0.2 -22.0	100.0 64.9 4.1 9.6 21.4	100.0 55.7 4.3 10.4 29.6
Urban, total	23,748,000	20,597,000	3,151,000	15.3	100.0	100.0
Private bath and private flush toilet	19,349,000 1,201,000 1,930,000 1,268,000	15,830,000 1,227,000 2,193,000 1,347,000	3,519,000 26,000 263,000 79,000	22.2 -2.1 -12.0 -5.9	81.5 5.1 8.1 5.3	76.9 6.0 10.6 6.5
Rural-nonfarm, total	7,533,000	7,151,000	382,000	5.3	100.0	100.0
Private bath and private flush toilet	4,029,000 273,000 987,000 2,244,000	2,823,000 223,000 941,000 3,164,000	1,206,000 50,000 46,000 -920,000	42.7 22.4 4.9 -29.1	53.5 3.6 13.1 29.8	39.5 3.1 13.2 44.2
Rural-farm, total	6,319,000	7,107,000	-788,000	-11.1	100.0	100.0
Private bath and private flush toilet	1,007,000 62,000 705,000 4,545,000	776,000 37,000 480,000 5,814,000	231,000 25,000 225,000 -1,269,000	29.8 67.6 46.9 -21.8	15.9 1.0 11.2 71.9	10 9 0.5 6.8 81.8

family characteristics, and estimates of the labour force, employment and unemployment 1940 and 1930.

Characteristics of persons not in the labour force. Comparative occupation statistics, 1870-1940.

Families (eight reports), including tenure, rent, family income, type of family, employment status, general characteristics, size of family and age of head, and characteristics of rural-farm families.

Characteristics of housing, by type of structure. Index of housing reports.

(See also Aliens; Birth Statistics; Death Statistics; Housing; Immigration and Emigration; Marriage and DIVORCE; WAGES AND HOURS; WEALTH AND INCOME, DISTRI-BUTION OF.)

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Central America

Defined geographically, Central America includes the six republics of Guatemala, El Salvador, Honduras, Nicaragua, Costa Rica, and Panamá and in addition the British crown colony of British Honduras (or Belize) and the Panama Canal Zone. Area, approximately 227,500 sq.mi.; pop. approximately 9,045,000.

The whole Central American area, with the conspicuous exception of British Honduras, of course, continued to be greatly subject to political and economic influence from the United States, during the decade 1937-46, primarily because of the fact that Panamá and Nicaragua presented the two most feasible routes for construction of an interoceanic canal, a project in which the U.S. had been interested from early in the 19th century. Even in later years, U.S. economic influence as measured in terms of trade and investments, though dominant in Central America, was not as important as the historic political interest of the U.S. in that area would lead one to assume. Central America, along with the republics of the Caribbean, was the scene of the earlier U.S. experiments with protectorates, both Nicaragua and Panamá having been commonly classed as such at one stage by most authorities.

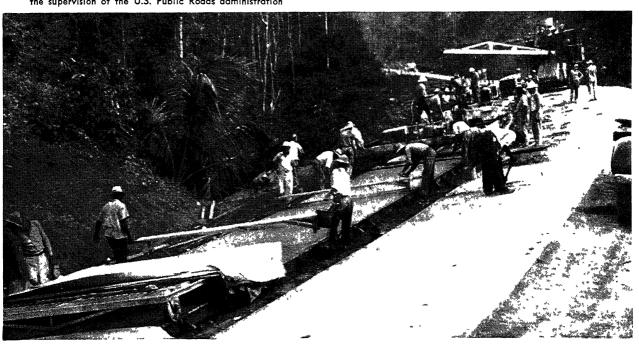
The inauguration of the "Good Neighbour policy" in the 1930s, while it did not lessen the amount of U.S. influence in Central America, clothed it in more acceptable form and hence the later relationships of the independent units in that area with the U.S. were significantly different from what they were a generation earlier. The beginning of 1937 found strong dictators in power in four of the Central American republics—Gen. Jorge Ubico in Guatemala; Gen. Maximiliano Hernández Martínez in El Salvador; Gen. Tiburcio Carías Andino in Honduras and Gen. Anastasio Somoza in Nicaragua. The U.S. maintained friendly diplomatic relations with all of them despite uncrystallized criticism of such a relationship from various democratic elements in the different dictatorships. While the several dictators remained in power, the period was one of nationalism, although the four dictators worked harmoniously together in suppressing revolutionary movements.

The outbreak of World War II in Sept. 1939 brought serious economic problems to all of Central America, largely because the monoculture character of its economy and its essentially colonial economic development made it dependent on foreign trade in great measure and hence vulnerable in the face of deep dislocation of that trade. The quick diversion of shipping to more immediately pressing wartime needs, in addition to the submarine menace which soon began to affect the Caribbean sea lanes, promptly cut into the shipping available for transportation of Central American commerce, a very large part of which was water-borne. Honduras, with bananas as its traditional important export product, was especially hard hit. Guatemala and El Salvador had inadequate rail links with the countries to the north, but otherwise railway and even highway connections were almost entirely lacking.

Panamá was host to the first conference of foreign ministers or their representatives, held at Panamá city Sept. 23-Oct. 3, 1939. All of the Central American republics (but not British Honduras or the Panama Canal Zone) were represented at the conference and took an active part in it despite thinly veiled threats previously made by the German minister to the Central American states. All of the Central American republics declared their neutrality at the outbreak of the war but co-operated closely with the U.S. in measures designed to protect the hemisphere and preserve its neutrality. Panamá became the spokesman

Highway across the isthmus of Panama, completed in 1942 under the supervision of the U.S. Public Roads administration and clearing house for all republics of the hemisphere in conducting correspondence with regard to the "neutrality zone" established around North and South America south of Canada by action of the first foreign ministers' conference.

All units of the area were concerned in the early stages of the war as well as later with the suppression of fifthcolumn and espionage activities. This concern was naturally greatest in Panamá and the Canal Zone, where very stringent precautions were taken from the outbreak of the war. Each of the republics had small but usually active and well-organized axis minorities; these were estimated as follows: Guatemala, 1,500 Germans plus 2,200 nationals of German descent and 420 Italians; El Salvador, 1,175 Germans plus 2,200 nationals of German descent, 625 Italians plus 4,400 nationals of Italian descent and 25 Japanese; Honduras, 440 Germans plus 510 nationals of German descent, 200 Italians and 5 Japanese; Nicaragua, 150 Germans, 65 Italians and "a few" Japanese; Costa Rica, 1,000 Germans plus 3,500 nationals of German descent, 700 Italians and 40 Japanese; Panamá, 175 Germans plus 1,000 nationals of German descent, 600 Italians plus 750 nationals of Italian descent and 400 Japanese. "Spy scares" were frequent in the early months of World War II, and definite activity was conclusively proved in Panamá, British Honduras and elsewhere. The German minister to Central America again attempted interference with the diplomatic freedom of those republics prior to the second foreign ministers' conference at Havana, Cuba, in July 1940, but without success. The chief question up for consideration at that conference was the possible disposition of European possessions in the Caribbean area in case nazi Germany should attempt to assume control of French, Dutch and possibly British colonies. With about a dozen European colonies situated within a few hundred miles of Central America, and British Honduras as a direct part of it immediately adjoining Guatemala, the problem was naturally of great concern to Central America. The several republics joined wholeheartedly in working out the formula at Havana for "provisional ad-



ministration," though Guatemala, because of a long-standing boundary controversy with British Honduras, made a reservation with regard to the applicability of the plan to that colony.

The economic pinch of trade disruption was keenly felt by 1940, but the Inter-American Coffee Quota agreement of Nov. 1940, with its promise of coffee price stabilization, and financial aid from the U.S. materially lessened the economic strain. The basic production quotas allotted the five Central American republics (Panamá was not a party to the agreement) were as follows: Guatemala, 535,000 bags of 60 kg.; El Salvador, 600,000 bags; Honduras, 20,000 bags; Nicaragua, 195,000 bags; Costa Rica 200,000 bags; actual production and allowed exports practically always exceeded those figures, however.

The Japanese attack on Pearl Harbor brought very prompt response from the Central American states; all of them had declared war upon all major axis states by Dec. 13, 1941, and Costa Rica's declaration of war upon Japan actually preceded that of the U.S. by a few hours. The situation was strikingly in contrast with that in 1917-18, when five of the republics (El Salvador excepted) declared war upon Germany but, except for Panamá, only after delays of from 12 to 15 months after the U.S. took the action. Most observers were inclined to credit the prompt action in 1941 as political dividends paid by the Good Neighbour policy. Political opponents of the various dictators were disposed to credit their action to realization of the opportunity for harsher and more complete domination of their respective countries under the guise of exercising emergency wartime powers.

Co-operation of the Central American governments in hemispheric defense continued unabated in 1942. They employed such methods of countering subversive activities as arrest and deportation of dangerous aliens, sequestering of enemy alien property, increase and better equipment of their armed forces, and production of strategic materials. The U.S. and the United Nations did not at any time expect or ask the Central American states to contribute military, naval or air contingents to participate in the fighting directly, but those states were strongly urged to increase their production of materials contributing to the war effort. The United Fruit company, in conjunction with the U.S. Board of Economic Warfare, speeded plans for the cultivation of some 40,000 ac. of abacá, as a substitute for manila hemp in Costa Rica, Honduras, Guatemala and Panamá, and for rubber plantings in Honduras and Costa Rica; by 1944 abacá plantings in the four countries mentioned were reported to have reached 26,000 ac. The Rubber Development corporation (a U.S. government agency) in several cases contracted for the entire national output of Central American states through 1946. Other products supplied in increasing amounts by Central America for the war effort included balsa wood, mahogany and other hardwoods, cinchona, roselle fibre, loofa sponges, balsam of Peru (found almost exclusively in El Salvador), rotenone and others.

In all of the states it proved necessary to establish governmental controls over motor vehicles, tires and fuels, and also to set price ceilings on at least some commodities, principally foodstuffs. Interference with water-borne transportation continued to be serious, especially because of the shortage of tankers, as Central American local industry and transportation depended largely on imported fuels. The disrupted shipping situation led to large-scale efforts during 1942, continued until Sept. 1943, to complete a

military highway through Central America in order to transport strategic products to Mexico, whence they might be shipped by rail to the U.S., and to carry supplies to the Panama Canal Zone and points en route. After the 1920s, the U.S. Public Roads administration, assisted by congressional appropriations for surveys and bridge building, had aided the Central American governments in construction of portions of the permanent inter-American highway to extend from the U.S. border to the Canal Zone. The military highway was designed in 1942-43 as a substitute or alternative route, ostensibly to take advantage of easier grades and better locations. With the decline in submarine sinkings in 1943, the military project was suddenly abandoned in September. As early as the closing months of that year, reports began to circulate widely of wholesale waste in construction.

A U.S. senatorial subcommittee, holding hearings at Los Angeles, Calif., on Sept. 3-4, 1946, disclosed many details of the apparent mismanagement and waste that had entered into construction of the military road. U.S. army engineers testified before the subcommittee that \$36,000,ooo was spent during the ten months of active construction work but asserted that war department indifference to their pleas for priorities for construction materials and machinery defeated the project. The ultimate cost of the military road was estimated at \$160,000,000, or more than ten times the original war department estimate. Charges made during the testimony were that the Public Roads administration and the military forces were engaged in construction of parallel roads in some places at the same time, that the roads administration in two cases made detours to bring the permanent highway to ranches owned by the presidents of Nicaragua and Costa Rica, that political and other extraneous considerations influenced the location of the highway in various places, that three bridges were built in Nicaragua on a route which was later abandoned, etc. It was asserted that, in addition to the \$36,000,000 spent by the U.S. army, the Public Roads administration had spent a total of \$57,200,000 on its route by Sept. 1946 and that \$65,000,000 additional would be necessary to complete that road.

Though the shipping situation definitely improved during the later years of World War II, shortages were still felt in Central America, both because of the lack of supply of consumer goods and the shortage of cargo space. Lack of fuel oils, gasoline and tires was estimated to have resulted in as much as a 50% decline in automotive traffic in some parts of Central America; Honduras was especially affected. Employment was stimulated by new wartime agricultural projects, highway construction (until autumn), and the recruiting of labourers from several Central American republics for large-scale construction projects in the Canal Zone. The T.A.C.A. air line (Transportes Aéreos de Centro América), one of the pioneer aviation companies in Central America with headquarters at Tegucigalpa, Honduras, was purchased by U.S. capital during 1943.

(See also articles on individual countries.)

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(R. H. FN.)

Central European and Balkan Literature

Under this heading are grouped the literatures of the countries of Europe's middle zone, extending from the Baltic to the Adriatic and from the Alps to the Black sea.



Stefan Zweig, whose autobiography, The World of Yesterday, was published in 1943, a year after the exiled Austrian novelist died in South America as a suicide

Austria.—Nazi doctrines and tyranny did not succeed in suppressing Austrian literature or diverting it from its traditional sources of beauty and musical inspiration. On the contrary, the terrible events of 1938–45 produced a remarkable harvest of dramatic works, poems, novels and essays which reflected the deepened love of the Austrian poets for their country. This was movingly expressed in many works both of writers who went into exile and those who could not or would not leave their country. Some writers could not, unfortunately, resist the influence of nazi doctrine or the honours offered them under Adolf Hitler's rule, among them the highly gifted poet Josef Weinheber. When the nazi regime collapsed, he and several others committed suicide.

Many of the most beautiful poems and the finest novels of this period were written by women, and writers originating from the Austrian Alpine provinces successfully challenged the former literary pre-eminence of Vienna. Their style was distinguished by its austerity, virility and precision. Only a few of the prominent writers and their works can be mentioned here. Among the plays, Max Mell's Nibelungs was perhaps the most remarkable. In Franz Csokor's Calypso and The Lost Son, the Odyssean wanderings of the author and the tragedy of the "partisan" were masterly rendered. Franz Werfel's Jacobowsky and the Colonel was a penetrating condemnation of racial discrimination and nazi barbarism. Hans Weigel's and Ferdinand Bruckner's works showed great talent and mastery of characterization. The works of the lyric poets included Knight, Death and Devil by Paula Preradović, who was imprisoned; The Titans, by Alexander Lernet-Holenia, a collection of poems of great beauty; and equally fine collections of poems by Felix Braun and by Kaethe Braun-Prager. Among the novels, Erika Mitterer's The Prince of the World, Paula Preradović's Pavi and Pero and Franz Werfel's Song of Bernadette were outstanding; among the essays Rudolf Kassner's Transfiguration, Werfel's Utopian Between Heaven and Earth and Raoul Auernheimer's Grillparzer should be mentioned as well as Stefan Zweig's autobiography, The World of Yesterday.

Bulgaria.—Ever since its beginnings during the struggles for liberation from the Turks in the 19th century, Bulgarian literature had borne the signs of a society in transition. These signs were even more evident during the years 1937–46, when Bulgarian writers, facing a world in turmoil abroad and sharp social conflict at home, did not remain detached observers and recorders of events. They took sides with the conviction that the historical moment called for active spiritual leadership. Where they took inspiration from foreign literature, the majority of them looked to H. G. Wells, George Bernard Shaw, J. B. Priest-

ley, Upton Sinclair and Ernest Hemingway rather than to John Galsworthy, Sir James M. Barrie or Somerset Maugham. They believed in realism, awareness of the social conflict and active participation in it. During the years of German domination over Europe, some writers allowed the nazi doctrine to influence their work, but the majority retained their independent spirit. Many joined the underground movement and the war for liberation against the Germans. Some, like N. Yonkov, gave their lives in the struggle. Others survived, and their writings came to reflect all the rousing, impulsive and often rough ways of a revolutionary period. After the liberation, the Writers' union, under its president L. Stoyanov, struck off the names of 29 writers who had shown fascist tendencies and elected 85 new members. Among successful authors who wrote books during the decade were L. Stoyanov, K. Petkanov, G. Raitchev, A. Karalyitchev, Sv. Minkov, G. Karaslavov, G. Belev, D. Gabe, O. Vassilev, M. Grubeshlieva, N. Hrelkov, Lamar. In the field of lyrical verse K. Christov and E. Bagriana kept their prominent posi-

Czechoslovakia. - Czechoslovak literature during the years 1937-46 again produced a phenomenon frequently recorded throughout the history of the Czechoslovak people, viz., that at the most critical junctures in the history of the nation the Czech or Slovak authors undertake the task of moral leadership. Several years before the Munich catastrophe, the works of Czech and Slovak authors showed already a strengthening of the national consciousness. Then, the tragic year of Munich produced a whole series of works pervaded by a new kind of nationalism, a nationalism not directed against other nations, but prompted by the instinct of self-preservation and inspired by the age-old springs of the democratic tradition. The last two dramas of Karel Capek, the greatest Czech playwright, The White Plague and The Mother, were the highest expression of these two tendencies: healthy nationalism and democratic humanism.

During the German occupation the authors who remained in the country had to choose between silence and allegorical writing. While a number of the leading poets and prose writers preferred silence and did not publish the works which they had produced during this period until after World War II, others, such as the prose writers Josef Kopta and Jan Drda and the poets Josef Hora and Jaroslav Seifert, chose to write what appeared to be harmless allegories meaningless to the German invaders, but full of significance to the Czech reader in whom they instilled new faith. Others, instead, turned to historical subjects which not only filled the Czech reader with national awareness and pride, but by analogies from the past provided hope for the future. The war and the German occupation, however, deprived Czechoslovak literature of several leading authors. Thus, Josef Čapek, Karel Čapek's brother and his collaborator in several works, died in a German concentration camp; Vladislav Vančura, the best of the advanced prose writers, was executed; and if the death of Karel Capek could be attributed to the Munich events, the ordeal of the German occupation undoubtedly hastened the deaths of Josef Hora and Karel Toman, two of the greatest contemporary Czech poets. At the same time, the sufferings of the war period matured several new authors. Of these, Václav Řežác and Miroslav Hanuš were perhaps the most promising of the prose writers. Among the poets should be mentioned Jiři Orten, who died tragically during the war, František Hrubin, Laco

Novomeský, Vladimir Holan and Kamil Bednář, the latter of whom, next to František Halas and Vítězslav Nezval, became foremost among the younger poetical generation. In drama, the war brought little of lasting value, but in literary criticism, the heritage of F. X. Šalda, a critic of truly universal standards, was taken over by Václav Černý. Abroad, literary work was carried on by those who had gone into temporary exile. Here should be mentioned, in particular, František Langer and Egon Hostovský. Even though these two literary groups developed in different surroundings, the spirit of them both had much in common and may perhaps best be qualified as "humanistic realism." (V. F.)

Greece.—In the early 1930s Greek literature, freed from the dominating influence of the older literatures, in particular those of the western and northern countries, had begun to deal in its own way with the problems of Greek social life. Conflicting social theories found their reflection in the writings of that period. In this respect Greek literary life showed numerous analogies with similar developments noticeable in other countries. In general, Greece's representative writers took a positive and realistic attitude toward the world around them. Thus, in the novels published during the '30s, one finds evidence of a deeper insight into Greek life than had been customary previously. The characters portrayed, though essentially national, were set into social surroundings whose problems were not altogether divorced from those of other European countries. After 1936, under the dictatorship of Gen. John Metaxas, the severe censorship imposed on literature made writers disinclined to deal with social problems and the novels of that period reverted to purely descriptive narrative, with only here and there a hint of the writer's deeper social convictions, the subjects being confined to rural life or in some cases to the introspective analysis of the individual, on somewhat Freudian lines. Greek poetry during this period was developing in another direction. In common with developments elsewhere, France in particular, it showed a marked predilection for what was called "pure poetry" and, seeking new methods of expression, abandoned the strict discipline of traditional versification. Nevertheless, the older tradition in this field was still being maintained by Greece's great poet, Kostes Palamas, whose life work extended over half a century and who did much to introduce the culture of western Europe into his country.

During the Graeco-Italian War of 1940-41, literary activity was much reduced. Characteristic of this period was Hugelos Sikelianos' Sibylla, a tragedy in verse, which glorified Greek resistance. During the bitter period of axis occupation (1940-44) Sikelianos, who became the country's most outstanding poet, wrote songs and poems symbolic of national resistance which were circulated mainly by word of mouth. Of prose writings, few were published, most of them being historical chronicles, memoirs or descriptive novels. A tendency toward escapism was a characteristic feature of much of this writing. Nikos Kazantsakis, who, with Sikelianos, occupied the foremost position in Greek literary life, completed his epic poem The Odyssey and began to write his great tragedies by which he attempted to revive the antique drama in a new form. During the occupation years, the country lost many of its best writers and poets, among them Palamas, Ioannis Gryparis and Miltiades Malakasis.

After the liberation Greek cultural life revived. The confusion of ideas which characterized the immediate post-

war period was reflected in the fragmentary works of the resistance writers, but no great writer had yet arisen to provide a synthesis of Greek life during the terrible years of war and occupation. (E. E. Hs.)

Hungary.-The character of Hungarian literature during the years 1936-46 was determined partly by the troubled national and international background, partly by internal developments. The great generation of the Nyugat, with its conscious cult of originality and its revolt against "official" conservative standards, was slowly disappearing: G. Krudy's death in 1933 was followed by that of D. Kosztolanyi (1936), F. Karinthy (1938), M. Babits (1941), Zs. Moricz (1942), D. Szomory (1944) and D. Szabo (1945). The new writers who took their place were again ranged in two camps: the "urban" school and the "populists." The latter group, more numerous and more influential, were politically by no means homogeneous: their attitudes ranged from the fascist sympathies of Jozsef Erdelyi to the pro-soviet convictions of the Marxist Peter Veres. All writers of this school shared, however, a common faith in the peasantry as the backbone of the nation. Their collective attitude was expressed by the lyric poets Gyula Illyes and Jozsef Erdelyi; it permeated with social criticism the naturalistic novels of Janos Kodolanyi; it accounted for the work of the so-called "villageinvestigators" (Gyula Illyes, Peter Veres, Lajos Kiss, Jozsef Darvas, Zoltan Szabo, Ferenc Erdei, etc.) who revealed in their regional studies the misery of the rural poor. An interesting parallel development was the socialist activism of Lajos Kassak and Attila Jozsef who took their themes from the life of the urban proletariat. A synthesis of populist and urban tendencies was attempted by Laszlo Nemeth and by Transylvanian writers like Aron Tamasi and Jozsef Nyiro, but the gap dividing the two schools remained wide. Steeped in English and French culture, selfconscious in their artistic methods and literary style, the "urban" writers tended to feel superior to the collective school with its peasant mystique. The outstanding representatives of the urban school were Sandor Marai, Laszlo Cs. Szabo, Sandor Hunyady and Lajos Zilahy, Lorinc Szabo and Antal Szerb. The most powerful defender of European traditions was, however, Mihaly Babits.

World War II found hardly any echo in literature; there was no literary anti-Semitism and no trace of anti-Allied propaganda. The siege of Budapest created a much deeper impression, but its reflection in literature was limited to some short stories and reportage. (N. J. S.)

Poland.—Polish literature of the decade can be divided into three periods, each determined by political events.

The three years up to Sept. 1939 were a continuation of the inter-war period, which ended abruptly with the outbreak of World War II begun by the German invasion of Poland, whose cultural life suffered more heavily than that of any other European country. During this period lyrical poetry, previously marked by emotional vitality, showed an increasing tendency toward classicism. This was particularly noticeable in the mature works of Leopold Staff, even in such a primitive lyricist as Julian Tuwim among the representatives of the younger generation, but above all in the more rhetorical poetry of Antoni Słonimski. Outstanding among the younger poets was Władysław Sebyła with his penetratingly philosophic mind. The rising generation of poets was strongly influenced by Józef Czechowicz, regarded as a pioneer, although his chief appeal lay in the melody of his versification. Among the real vanguard Julian Przyboś and Tadeusz Peiper, both intellectuals and rationalists, continued to lead the way, while a note of social revolution was struck by Władysław Broniewski.

In fiction there was a noticeable turn to realism. Social interests delineated against varying backgrounds predominated. Among the most prominent representatives of this type were Juliusz Kaden-Bandrowski, a social psychologist and expressionist; Zofia Nałkowska, an intellectual experimenter; Maria Dąbrowska, who revived the traditional novel of manners; Wacław Berent, profoundly historico-philosophical in his approach; Ignacy Iwaszkiewicz, an outstanding stylist and analytical psychologist; Jan Parandowski, a master of narrative; Jan Wiktor, preeminent in his treatment of current social problems; Helena Boguszewska, with her penetrating analysis of current history; and finally Zofia Kossak, whose historical novels enjoyed great popularity. Outstanding younger writers were: Michal Rusinek, an expressionist; Zbigniew Uniłowski, a neorealist; Bruno Schulz, a surrealist; Witold Gombrowicz, who used the form of grotesque satire; Pola Gojawiczyńska, a naturalist; Michał Choromański and Maria Kuncewiczowa, both psychoanalytical in the treatment of their subject; Leon Kruczkowski, with his revised dialectical approach to historical and social themes. The social epic of the Polish village was treated by a number of writers, notably Wiktor Burek.

In dramatic art, which showed less vital impulse at that time, the following names may be mentioned: Jerzy Szaniawski, subtly psychological in his method; Jarosław Iwaszkiewicz, who excelled in characterization through dialogue; Ludwik Hieronim Morstin, a poetical aesthete; Antoni Cwojdziński, with his sparkling intellectual wit; Antoni Słonimski and Bruno Winawer, two satirists of bourgeois life; and Stanisław Ignacy Witkiewicz, an experimenter of complete originality.

The most notable literary critics and scholars were: Karol Irzykowski and Karol Ludwik Koniński, distinguished by their deep intellectual insight into the problems they presented; Tadeusz Boy-Żeleński, a satirical reformer of society and manners; Wacław Borowy, a profound cultural historian of strict aesthetic method; Karol W. Zawodziński, notable for his reviews of contemporary movements in poetry, and Leon Piwiński, for his reviews of fiction. Roman Dyboski, Andrzej Tretiak and Władysław Tarnawski were among eminent English scholars in these years; Stanisław Wędkiewicz and Mieczysław Brahmer were distinguished romance scholars and Wacław Lednicki was a brilliant authority on Russian literature.

To all appearances, cultural life ceased in Poland during the German occupation. It continued, however, in the "underground" resistance movement, though, constantly threatened by the Germans, it was of necessity conditioned by the needs of national preservation and the planning of the future. These circumstances did not favour creative literary production. The barbaric methods and highly developed technique which the Germans applied to the destruction of Polish culture caused losses which it would take years to make good. About 25% of the prewar members of the Union of Polish Writers were killed or died during the war. During the years of oppression, Polish literary activity could be found only among writers in exile, who had made their names in Poland before the war. Apart from topical themes, they contributed no new literary values.

Polish literary works were published again first in 1944 in Lublin, from which the Germans had already been driven. Four outstanding volumes of poems may be mentioned among these publications. They were by Julian Przyboś, Mieczysław Jastruń, Adam Ważyk and Jerzy Putrament, each differing in creative personality and poetic aspiration, yet all alike in their profound interest in social problems and virile will to fight for the national cause, and combining an appreciation of historical reality with a completely humanist conscience.

Among lyrical poets during the years 1945-46 one noticed, although with some exceptions, a deliberate desire to turn away from symbolism, combined with a keener sense of the social forces now at work. Of the prewar poets, Leopold Staff, Julian Tuwim, Władysław Broniewski and Antoni Słonimski were still writing. Two volumes of collected works attracted considerable attention: in his Miejsce na Ziemi (Place on the Earth) Julian Przyboś revealed a consistent poetic attitude blending an intellectually controlled feeling, permeated by a deep social consciousness. Czesław Miłosz in his Ocalenie (Salvation) touched on the contemporary experiences of the individual and mankind in general, expressed in traditional verse form, but with an enormously wide gamut of themes profound in thought and emotion. Among a host of poets the following stood out: Lucjan Szenwald, whose posthumous volume of impressions of the Polish army then being formed in the U.S.S.R. was distinguished by the melody of his richly poetic phrasing; Stanisław Ryszard Dobrowolski, by an eminently virile attitude and his challenge to the social order; Włodzimierz Słobodnik, by the touching lyricism of his reminiscences of exile in Russia; Zbigniew Bieńkowski, by an exceptionally mature debut as regards both his mastery of versification and emotional intensity.

It was understandable that literary prose in a higher degree than poetry should be affected by the impact of war and foreign occupation. Among the many authors who reached a high literary level while writing truthful reportage were: Michał Rusinek (Z Barykady w Dolinę Głodu, From the Barricades to the Valley of Hunger) and Seweryna Szmaglewska (Dymy Nad Birkenau, Smoke over Birkenau). Here too belong the writers of war stories on operations in the west, Ksawery Pruszyński (Droga Wiodła Przez Narvik, Our Way Led Through Narvik) and Arkady Fiedler (Squadron 303). As for the novel and short story form, as distinct from reportage, the following names should be recorded: Zofia Nałkowska, Helena Boguszewska, Jerzy Andrzejewski, Adolf Rudnicki, Pola Gojawiczyńska, Kazimierz Brandys, Stefan Otwinowski, Jerzy Putrament and Stanisław Piątek. The self-taught proletarian writer Jan Papuga made a fine start with his tales of the sea. Jarosław Iwaszkiewicz stood out for the quality of his prose and the high artistry of composition in his psychological narratives, embracing a great variety of human themes—as, for instance, in Nowa Miłość (New Love). Wojciech Zukrowski (Z Kraju Milczenia, From a Land of Silence), harking back to Henryk Sienkiewicz's style, proved a novelist of elemental power, with a good sense of realism and a fertile imagination. Novels of marked originality, with profound thought values, were produced by two writers; Tadeusz Breza in Mury Jerycha (The Walls of Jericho) gave a realistic portrayal of the Polish scene before the war, and Stanisław Dygat gave in Jezioro Bodeńskie (Lake Constance) an ironical analysis of wartime reality against the background of an international concentration camp on the German-Swiss frontier. Hanna Malewska and Tadeusz Hołuj wrote historical novels, while the novels of Jan Wiktor and Jalu Kurek were a blend of history and legend.

The postwar Polish novel was marked not only by the standard it reached but also by the variety and scope of its themes. The main tendency was toward an assertion of realism, whether social or humanist, or a combination of both. In literary criticism too the problem of realism was the most frequent subject. Jan Kott posed the problem most clearly in his historical meditations from Tacitus and Stendhal to Joseph Conrad and Malraux. The most interesting literary critics writing in contemporary journals included: Kazimierz Wyka, Wacław Kubacki, Andrzej Stawar, Karol W. Zawod-

ziński, Stefan Żółkiewski and, among the younger ones, Artur Sandauer and Wilhelm Mach. (K. Cz.)

Many Polish writers who escaped from German- or sovietoccupied Poland to France, Britain or the United States remained there after the liberation. At the end of 1946 the
greater number of Polish writers staying abroad were in
England. The best known were the novelist Maria Kuncewiczowa, the poets Stanisław Baliński and Marian Hemar;
Tymon Terlecki, historian of art and literature, and Zygmunt
Nowakowski, essayist. In the Paris group the most brilliant
was Zygmunt L. Zaleski, literary critic and essayist. In New
York lived Kazimierz Wierzyński, a poet who started his
literary career in the '20s by a volume on Spring and Wine
and published in 1946 a volume of his wartime verses deeply
reflecting Poland's tragedy. (X.)

Rumania.-In the interval of the two world wars, the development of Rumanian literature was so exceptional as to raise it in certain respects to an international level. On the eve of World War II two main schools predominated: the traditional school which drew its finest inspiration from indigenous sources, and the modern cosmopolitan school which stressed the necessity of a synthesis with world culture. World War II saw the dawn of one of the greatest periods in Rumanian literature. By 1940, German pressure on Rumania had become more and more insistent. Then, in June 1941, came war, forced upon Rumania by Germany. From then on Rumania experienced great suffering and humiliation. The presence on its soil of an "ally," which was in fact an implacable enemy, produced a moral conflict which reflected in its literature. The Germans tried, for their own benefit, to alter the very spirit of Rumanian culture, to cut it off from its natural sources and from its essential outside relations. Liberation in 1944 brought the end of this nightmare. One of the most important developments in 1945-46 was the cultural rapprochement with Russia.

In 1946 the great names in Rumanian literature were, however, still those which had adorned its pages after 1920. Poetry suffered the loss of Ion Pillat (1891-1945). Tudor Arghezi was still taking an enthusiastic part in contemporary literature, having lost nothing of the penetrating verve and the creative power which had made him a poet great even by world standards. Lucian Blaga continued his magnificent work as metaphysician and poet; during 1937-46 he published his Trilogy of Culture (1936-37) which together with his Trilogy of Knowledge gave a striking exposition of his philosophic theory; at the same time, in the new collections of his verses (In the Courts of Desire, The Secret Marches, 1943) the poet gave an increasingly profound and original accent to his cosmic and metaphysical inspiration. In the field of prose the same continuity appeared. The premature death of Pavel Dan (1907-37) robbed his country of a youthful genius of the first order. His only collection of short stories (Urcan the Ancient) was of such high quality as to ensure him a place of honour in his country's literature. Liviu Rebreanu, creator of the modern Rumanian novel, died in 1944. Mihail Sadoveanu continued to add to his reputation as one of the finest fiction writers of Europe. The gifted novelist, Cesar Petrescu, also continued to write. In the documentary and critical fields most of the names of note were already well-known before the war. The great historian Nicolas Iorga was savagely assassinated in 1940 by the fascist Iron Guard. Others, like Perpessicius (Dimitri Panaïtescu), Tudor Vianu, George Calinescu, Mihail Ralea, Serban Cioculescu, Vladimir Streinu, continued their work as literary critics, essayists or documentary historians. Many younger writers pressed on the heels of these masters. Several prose writers of undoubted talent may be mentioned, such as the novelists Radu Tudoran and Lucia Demetrius, Eusebe Camilar and Geo Bogza, both gifted descriptive writers; the novelist Ovide Constantinescu, and many others. Even more numerous were the young poets. A poetry folio published in May 1946 contained the verses of no fewer than 30 poets, most of them unknown before. It would be difficult to discriminate among the poets without injustice, but Mihail Beniuc, Emil Giurgiuca, Eugene Jebeleanu and Ion Frunzetti were of sufficient importance to be mentioned here.

Switzerland.—The intellectual life of German Switzerland during the years 1937–45 was thrown on to its own resources, for under national socialism those Germanic attributes which gained ascendancy in the reich were in direct opposition to the democratic, liberal, Christian and individualist features of the Swiss national character. The Germans of the reich and the ideology of fascism made scarcely an imprint on the work of contemporary Swiss writers. Undoubtedly Switzerland's national feeling and its liberal-republican spirit gave to its literature a cohesion which counterbalanced the centrifugal effect of the three great language groups outside its frontiers.

The careful and intensive cultivation of local tradition and peculiarities characterized the whole of Swiss literature and was particularly evident among the Rhaeto-Romanic authors of the Grisons (Graubünden) canton. It was also natural that the German-Swiss dialect should have maintained its tenacious hold; indeed each German-Swiss canton still produced its local bard. In the sphere of nondialect literature, too, "land and people" still predominated as the main subjects but the charming idyll of Seldwylertum, that is, of small-town life, grew outmoded, and a more sharply realistic outlook became general.

Naturalist prose in French attained the highest artistic level in the life work of the novelist C. F. Ramuz. Fribourg and the aristocratic-Catholie tradition of Switzerland found an exponent both combative and full of esprit in Gonzague de Reynold; and Geneva was represented by Robert de Traz and Paul Chaponnière. The noble art of Francesco Chiesa, most important Italian-Swiss writer, was also materially inspired by his native environment. Landscape and history were the twin sources of inspiration of German-Swiss writers, such as Emanuel Stickelberger of Basle (Holbein-Romane), Robert Faesi of Zurich (Die Stadt der Väter; Die Stadt der Freiheit), Gottlieb Heinrich Heer and Meinrad Inglin of Schwyz, who went back to the legendary sources of the confederation (Jugend eines Volkes) and painted a comprehensive picture of its fate in World War I (Schweizerspiegel). The introspective approach predominated in the self-analytic work of Hermann Hesse, a German by birth who acquired Swiss nationality and crowned his rich literary career with the Utopian novel, Das Glasperlenspiel. In German Switzerland, sincere fiction writers like Maria Waser (died 1939), Cécile Lauber, Regina Ullman and Ines Loos contributed to the enrichment of the narrative art. Felix Moeschlin and Jakob Bührer were concerned with social problems. In French Switzerland, the representatives of the psychological novel, Robert de Traz and Jacques Chenevière (Les Captives), disclosed the influences of the French school, as did Pierre Girard and Clarisse Francillon.

Although lyric poetry continued to be less a specific Swiss art—Swiss poetry was predominantly epic—there was

a surprising progress toward finer poetic expression. Among the German writers, that progress was evidenced by Albin Zollinger (1895–1941), Siegfried Lang, Max Geilinger, Max Pulver, Werner Zemp and in the religiously inspired poetry of the anthroposophists Albert Steffen and Hermann Hiltbrunner. The French poems of Henry Spiess, François Franzoni and René-Louis Piachaud were of real artistic value.

In the sphere of drama, two almost contradictory trends were evident: on the one hand, the indigenous, patriotic, often rural, tradition which was frequently sponsored by amateurs in festival performances (e.g., René Morax at Mézières) or in open-air theatres (Einsiedeln, Lucerne, Berne); and on the other hand, the internationally-minded theatre of the towns. In both spheres the producer Caesar von Arx was most successful (General Suter; Verrat von Novarra). In the theatres of the towns W. J. Guggenheim (died 1946), Albert J. Welti, Hermann Kesser and, representing the younger generation, Max Frisch all left their mark; so too did the French Swiss Alfred Gehri (Sixième Etage) whose work showed the influence of Paris.

The German-Swiss Eduard Korrodi and Max Rychner and the French-Swiss Robert de Traz, Henri de Ziégler and Charly Clerc were outstanding as literary critics. Walter Muschg (Gotthelf) and Emil Staiger gave a new impetus to the history of literature; Julius Schmidhauser (Der Kampf um das geistige Reich) and Hans Urs von Balthaser (Apokalypse der Deutschen Seele) to metaphysical writing; and Fritz Ernst, attempting to define Switzerland's spiritual status inside Europe (Helvetia Mediatrix), to the comparative study of civilizations.

In English-speaking countries, the work of the leading psychologist C. G. Jung, found increasing notice as did also that of Karl Barth and Emil Brunner, who renewed Protestant theology. (R. FI.)

Yugoslavia.—Strictly speaking, there was still no Yugoslav literature. There were at least two, or even three, different literatures, which might be classed under the name Yugoslav; there was a Serbo-Croat, i.e., a Serbian and Croatian, and a Slovenian literature. The Serbo-Croat literature used the same language, but while the Serbs, in the main, use Cyrillic script, the Croats use Latin script. Slovenian literature is written in Slovenian language, and uses Latin script. The liberation of Yugoslavia also gave birth to a new literature—the Macedonian—which did not exist in earlier times. The few Macedonian writers used to write in either Serbian or Bulgarian. They now used Macedonian language, which had established itself somewhere between the Serbian and Bulgarian languages. Modern Yugoslav literature, in the main, had been developing under French and Russian influences. German influences could, to some extent, be traced in Croatian and Slovenian literature. The modernist literature, flourishing after World War I, declined rapidly after 1930. It was both 'decadent and somewhat esoteric; it had nothing in common with the people and was therefore little read. The only modernists who survived were surrealists (their leader, Marko Ristitch, became Yugoslav ambassador to France), a survival to be ascribed to their acceptance of leftist ideology and to their social realism. Postwar Yugoslav literature was strongly social, revolutionary in its themes, though not in its language, and almost completely under the influence of Russian literature, old and new. During World War II, many writers were murdered by the axis soldiery, while some escaped to the mountains, actively fighting against the invaders. There, in spite of almost insuperable difficulties, they wrote books, mostly poetry, of blood and death, hope and pride.

The most representative writer of the new period, as of the preceding one, was Miroslav Krlezha. His fame spread outside his own country, and his books like Balade Petrice Kerempuha (Ballads of Petrica Kerempuh), Hrvatski Bog Mars (The Croatian God Mars), U Agoniji (In Agony) met with remarkable success. Vladimir Nazor, whom the Croats regarded as one of their greatest poets, joined the liberation army in 1943 and wrote a book in diary form entitled Sa Partizanima (With the Partisans). Steva Jakovljevitch, rector of Belgrade university in 1946, had a very great success with his book Trilogija (Trilogy). Ivo Andritch, a former diplomat, became also well-known as a writer; during 1945 and 1946 he published three books: Na Drini Chuprija (The Bridge on Drina), Travnichka Hronika (The Chronicle of Travnik), and Gospodjica (Miss). Rade Drainac, who died in 1943, exercised great influence on young writers before the war. Veliko Petrovitch with his Sto Prica (Hundred Tales) ranked also among the best Yugoslav writers. Among the Slovenes Prezhihov Voranc, Matej Bor, Jush Kozak, Alojzije Gradnik, R. Mrzelj and Franc Vodnik were in the front rank. Among the writers who made their names during and after the war were Radovan Zogovitch, Tchedomir Minderovitch, Branko Tchopitch and Ivan Goran Kovatchitch, whose poem Jama (Pit) was considered one of the best poems in Yugoslav literature. Kovatchitch lost his life during the war. Among the diarists, easily the best was Vladimir Dedijer, whose Dnevnik (Diary) was a fine chronicle of events from the beginning of revolt in Serbia (1941) until the day of victory. (A. Bil.)

Ceramics

See Feldspar; Interior Decoration.

Cereals

See Barley; Corn; Oats; Rice; Rye; Wheat.

Ceylon

A British crown colony lying off the southern extremity of India and approaching within 6° of the equator, Ceylon has an area of 25,332 sq.mi.; capital Colombo (census 1931, 284,155); chief towns: Jaffna (45,708); Galle (38,424); Kandy (37,147). Languages: English, Sinhalese, Tamil. Religions: Buddhism, Hinduism, Mohammedanism and Christianity. Pop. (census 1931) 5,312,548; (est. 1944) 6,384,000; Sinhalese 4,000,000; Tamils 1,500,000; Moors 325,000; Burghers 35,000; Europeans 10,000. Governors of Ceylon during the decade 1937–46 were: Sir Andrew Caldecott (Jan. 19, 1937–Sept. 1944); Sir Henry Monck-Mason Moore (after Sept. 19, 1944).

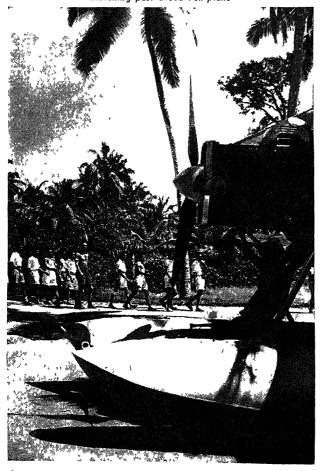
The widely differing racial and religious groups reproduced in miniature some of the difficulties which India encountered in progress toward self-government. Under the Donoughmore constitution of 1931, the government was vested in a council of state, elected by all male citizens over 21 and all women over 30. Sixty-five members were elected territorially, three appointed ex officio and up to 12 nominated by the governor. The council of state divided itself into seven executive committees, each with its chairman. The chairmen, together with the chief secretary, the treasurer and the attorney general, formed a board of ministers which was responsible for conducting the business of government and framing the budget. In practice the Donoughmore constitution proved acceptable to no political party. In the words of the governor, it developed "no party programs, policies or loyalties."

As soon as World War II was over, a commission presided over by Lord Soulbury drafted a fresh constitution which was accepted by the council of state by 51 votes to 5. The council of state was replaced by a parliament consisting of two houses, a senate with limited authority and a house of representatives elected by adult suffrage. This parliament was given full powers to legislate on all domestic matters; but certain subjects, such as the protection of the rights of racial and religious minorities, foreign affairs, defense and currency were vested in the governor. Thus Ceylon provided the first instance of a member of the colonial empire with a non-European electorate reaching the threshold of dominion status.

From 1937 to 1946, considerable progress was made in local self-government. Village communities were encouraged to take responsibility for managing their own affairs, and two special reorganization officers, one Tamil and one Sinhalese, were appointed as travelling advisers. A great impetus to the co-operative movement was given in 1943, when over 1,000 new co-operative societies were started. Pedigree cattle were imported from Australia to raise the standard of stock breeding, and selected students were sent over to India for veterinary training.

Every effort was made to render Ceylon self-supporting during World War II. The production of essential products such as rice and copra was increased, and rural schools undertook the cultivation of 30,000 ac. of land. Factories for the production of quinine, acetic acid and plywood

Recruits at the Royal Naval Aircraft establishment in Ceylon marching past a Sea Fox plane



	19	38	. 1943				
İtem	Value (000's omitted	Amount or	Value (000's omitted)	Amount or Number			
Exchange rate	•						
Great Britain		13 3 Indian Rupees =£1		133 Indian Rupees =£1			
United States		1 Indian Rup =36.5 cents	ee	= 30.1 cents			
Finance			0				
Government revenues	£8,484 (\$41,476)		£14,947 (\$60,312)				
Government	00.400		£13,826				
expenditures	£8,632 (\$42,204)		(\$55,789)				
National debt	£16,062 (\$78,526)		£16,006 (\$64,583)				
Transportation							
Railroads		951 mi.		913 mi.			
Highways		5,856 mi.		4,597 mi.			
Waterways (Canals) .		165 mi.		136 mi.			
Communication							
Telephones		1,433		11,718			
Telegraph lines		3,158 mi.		4,628 mi.			
Radio sets		6,007		11,628			
Minerals	0.00	7					
Graphite	£89 (\$435)	7,592 tons					
Granite	£26	•••					
Precious stones	(\$128) £22 (\$110)	•••					
Crops	•						
Tea		117,868 tons					
Coconuts*		84,443 ,,					
Rubber*		57,309 ,,					
Livestock							
Cattle		1,127,150 543,259		1,081,678			
Buffaloes		543,259		568,891			
Goats		232,542		263,653			
Exports—Total	£20,069 (\$98,115)	• • •					
Теа	£12,906 (\$63,095)	118,000 tons					
Rubber	£3,389 (\$16,567)	57,000 ,,					
Coconut oil	£1,052 (\$5,144)	84,000 ,,					
Imports—Total	£17,684 (\$86,458)	•••					
Rice	£4,067 (\$19,884)	585,000 tons					
Cotton piece goods .	£1,145 (\$5,599)	63,474,000 yd.					
Liquid fuel	£999 (\$4,882)	120,313,000 gal.					
Education	14-10021	94"					
Sinhalese and							
Tamil Schools		3,175†		4.114+			
Students		561,601†	į.	4,114‡ 503,293‡			
English and Bilingval		,,	•				
Schools		408†		408‡			
Students		102,238†		73,728‡			
*F		1					

Ceylon: Statistical Data

were established, and researches in cotton-growing were undertaken. The plumbago mines were working at full capacity, and valuable deposits of iron ore were discovered. Good progress was made with the Watawela hydroelectric scheme. With the fall of Malaya, Ceylon became the chief source of natural rubber in the empire. A "grow more rubber" campaign was inaugurated, and in 1942 125,400 short tons of rubber were produced by "slaughter tapping" and other intensive methods of production.

11942.

*Exports only.

Ceylon's progressive educational policy and high standard of literacy continued. Before World War II a rural reconstruction campaign, including an extensive program of adult education, was in progress. In 1940, the foundation stone of a Moslem training college was laid, and a school of agriculture was opened at Peradinya near Kandy. One of the last acts of the council of state was to debate a report of a committee appointed to consider the educational defects of the island, and its leading recommendation was that all education, from the kindergarten to the university, should be free. In 1946 this was being carried into effect. The leading event of the period, however, was the foundation in July 1942 of the University of Ceylon as an autonomous body conducting its own examinations. This was achieved by the amalgamation of the Ceylon university college, which had been formerly affiliated with London university, and the Ceylon medical college.

Ceylon's strategic position brought it into the front line early in the war, and civil defense measures were well in hand before the declaration of hostilities by Japan. A civil defense committee was set up, and more than 30,000 people enrolled in civil defense and air raid precaution services. These measures were severely tested by the great air raid on Colombo harbour on April 5, 1942, when several ships were sunk and harbour installations damaged, but the raiders were driven off with a loss of 27 planes. A raid on the harbour of Trincomalee was also repulsed, but the aircraft carrier "Hermes" was sunk. An essential service labour corps was recruited for the construction of aerodromes and defense works, loading and unloading of ships and other similar services. The general policy was that manpower which could be spared from non-essential industries should be employed in local defense, but volunteers from the Ceylon planters' rifle corps saw service in Syria and Libya, and a unit of the Ceylon garrison artillery went abroad in 1941. Some hundreds of Ceylonese served overseas with the royal army service corps. Military service for Europeans was made compulsory.

As the tide turned, Ceylon was equipped as an offensive base. Aerodromes were hacked out of the jungle, and aircraft and military supplies of every kind poured into the island from Great Britain, Australia and the U.S. In April 1944, Admiral Lord Louis Mountbatten moved his headquarters to Ceylon, which was to be the springboard for the assault on Malaya. The attack launched upon Sumatra with warships and aircraft carriers was the prelude to a large-scale invasion, which was forestalled by the surrender of Japan on Aug. 14, 1945.

All communities contributed generously to the war effort. Gifts for aircraft amounted to £375,000 from government and £236,800 from private sources. (H. G. RN.)

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Chain-Reaction Pile

See Physics.

Chamberlain, Arthur Neville

Chamberlain (1869–1940), British statesman, was born March 18, 1869, the son of Joseph Chamberlain. He was educated at Mason college, Birmingham. For many years he engaged in business in Birmingham and was lord mayor of the city in 1915–16. During World War I he was director of national service, and in 1918 he was returned to parliament from the Ladywood division of Birmingham. In 1922 he was appointed postmaster general, and later was minister of health and chancellor of the exchequer, holding each post twice. In May 1937 he succeeded Stanley Baldwin as prime minister.

As prime minister Chamberlain was confronted with the task of meeting the growing menace of Germany to the peace of Europe. His policy of "conciliating" Hitler culminated in the pact of Munich in 1938, which he declared guaranteed "peace in our time." But Hitler's breaking of the pact in March 1939 by the occupation of Czechoslovakia, convinced Chamberlain of the threat of German aggression. He pledged Britain's support to Poland if attacked, and when Germany made war on Poland, Great Britain and France declared war against Germany. He was succeeded as prime minister by Winston Churchill May 10, 1940, and gradually withdrew from all political activity. He died at his country estate, Heckfield house, Odiham, Hampshire, on Nov. 9, 1940.

Chambers of Commerce

A staggering share of the effort to surmount the problems of World War II fell upon U.S. business, since solutions to a great extent lay in the full utilization of available manpower and material for the production and distribution of goods. As a major spokesman for business, the responsibility of the Chamber of Commerce of the United States multiplied many times during the decade 1937-46. The chamber, with headquarters in the heart of the nation's capital, served as a day-by-day liaison between business and government. It carried to congress, and to the administration, the opinions of business on national affairs. In turn, it gave to business, in the manner of an information clearing house, not only the attitudes and actions of congress and the administration, but also a broad measure of technical assistance to strengthen the processes of free enterprise.

The chamber was created in 1912 to supply to government agencies and the law-making authorities the considered judgment of business on economic issues and to interpret to business the operations of the federal establishment. It united into a federation of business enterprise some 1,700 local chambers of commerce, and 500 national and state trade associations. These commercial bodies themselves had a membership of more than 1,000,000 firms, corporations and individuals in 1946. A majority of the largest business concerns of the country, as well as a host of smaller concerns, were sustaining members of the organization.

The chamber at the end of the decade was divided into departments representing the major groups of business enterprise, each department having an advisory committee of business men to propose policies. Something of the work of the chamber within the ten-year period 1937–46, as carried on by its departments and committees, is told in the following summary:

The chamber's agricultural committee worked to bring about better understanding of the interdependence of rural and urban areas, as a necessary achievement for national prosperity.

The Committee on Distribution sought to promote the interests of the distributive and service trades. In 1946, the committee entered into a long-range program for faster and broader distribution methods, and wider dissemination of information.

Early in the ten-year period, the chamber began the task of formulating workable policies in regard to labour-management problems. Its Committee on Manufacture worked unceasingly to narrow the breach between the two groups, as a means of expanding industrial production, especially during the war, and in the postwar period. The chamber was an active participant in the labour-management conference called by the government in the fall of 1945.

The chamber's Foreign Commerce department co-operated with exporters and importers in seeking removal of trade barriers and improving trade relations. A joint committee composed of representatives from both the U.S. chamber, and the Canadian Chamber of Commerce, operated to further trade between the two countries. A Pan-American committee also was activated, to accelerate the clearance of trade channels between the U.S. and its sister republics to the south.

Increasing the usefulness and effectiveness of local chambers, through interchange of ideas on community develop-

ment programs, was a major project of the chamber's Commercial Organization department. Also, the establishment of special committees was sponsored within local chambers, to improve the nation's educational plan. Studies made by the chamber's Committee on Education showed that where educational levels were high, living standards were high, and business and the community profited accordingly.

War increased the responsibility of insurance companies to provide security and protection. Therefore, a special advisory committee was initiated within the chamber structure, to assist in reducing the national burden of illness and disability.

Veterans' affairs were given attention by a special assistance staff.

Problems relating to housing were examined closely by the chamber's Construction and Civic Development department, and pertinent legislation was followed closely. The chamber believed that construction was a problem to be met primarily by free enterprise.

A unified program for the preservation of natural resources was upheld by the chamber, as well as plans for the best possible utilization of the nation's transportation and communication systems, in peace as well as in war.

The broad field of finance and government fiscal policies at home and abroad, were of increasing concern to business and the chamber. To increase the understanding and interpretation of numerous economic problems, a new unit was added to the chamber's departmental structure: a Department of Economic Research. Here, specialists examined economic data, and served as a research staff for business, and often for government, on a multitude of related subjects.

Another office activated during the period, the Department of Governmental Affairs, was given a broad directive to strengthen the over-all relationships between government and business. This department was created to act as a co-ordinator of chamber policy and as a working link between congress and chamber members. Under its sponsorship, more than 1,500 National Affairs committees were formed in local chambers and in trade associations, to encourage individual action for better government.

The U.S. defense period, the years of war and the reconversion period necessitated unusual activity along specific lines by the chamber. First, a special committee on national defense was formed. And, with the onset of hostilities in Dec. 1941, a War Service division was established as a central clearing desk on matters pertaining to production and preparedness. A Win-the-War committee integrated the whole national organization of the chamber behind the war effort. As an aid to cities in postwar development, the chamber named a Committee on Urban Problems to assist on matters relating to housing, public works and transportation, as well as civic advancement.

During the ten years the chamber participated in hundreds of conferences held by governmental, business, educational and other groups. At the international business conference at Rye, New York, in 1944, chamber representatives met with businessmen from 52 nations. The chamber was invited to name a representative to the United Nations Educational, Scientific and Cultural Organization.

In 1945 the U.S. associates of the International Chamber of Commerce, formerly allied only with the National Chamber, as the American section of the International Chamber, came under the sponsorship of four national business groups, including the Chamber of Commerce of the U.S. Activities of the organization were necessarily at

a standstill during World War II, but in the postwar period plans were underway for the furthering of business and cultural relations among the nations. (W. K. J.)

Junior Chambers of Commerce.-The United States Junior Chamber of Commerce, founded at St. Louis, Mo. in 1920, experienced a rapid growth in membership during the decade 1937-46 and by the latter year was serving more than 1,100 communities in the U.S. Associate junior chambers of commerce had been established in 25 countries other than the U.S., and the Junior Chamber International was formally organized on March 3, 1946. The U.S. organization, composed exclusively of young men aged 21 through 35, concentrated upon community service, leadership training and the development of a feeling of responsibility toward government and community life. The principal headquarters were established in Chicago, Ill. Presidents during the decade 1937-46 were as follows: 1936-37, Walter E. Holman, Portland, Ore.; 1937-38, Roswell P. Rosengren, New York city; 1938-39, Philip C. Ebeling, Dayton, O.; 1939-40, Perry P. Pipkin, Memphis, Tenn.; 1940-41, Mark S. Matthews, Miami Beach, Fla.; 1941-42, Walter W. Finke, Minneapolis, Minn.; 1942-43, William M. Shepherd, Pine Bluff, Ark.; 1943-44, H. Bruce Palmer, Newark, N.J.; 1944-45, Mearns T. Gates, Pomeroy, Wash.; 1945-46, Henry Kearns, Pasadena, Calil. (H. Ks.; X.)

British Chambers of Commerce.—Although it was difficult to generalize about a group of independent, selfgoverning organizations, varying greatly in size and scope, a few trends could be discerned in the development of chambers of commerce in Great Britain during the years 1937-46, a period dominated throughout first by the threat, then the reality, of war. In 1935-45 the membership of the chambers in the Association of British Chambers of Commerce rose by more than 25%. Affiliation to the association continued to be regarded as the criterion for a chamber proper, as against an organization concerned primarily with retail trade and purely local affairs. This growth in the support given by industry and trade to the movement as a whole was partly an index of the growing sense that organized representation of business interests is essential. It also showed the value of the chambers' services, and the fact that their functions did not generally overlap those of trade associations, whose number and strength advanced correspondingly in the same years,

The increase in government interference in economic matters was partly responsible for the greater appreciation of the value of business organizations. This trend was already apparent before World War II, but was tremendously accelerated in the process of national economic mobilization. During the war years there was constant need for the chambers to put before the government the point of view of the business man, to explain his problems, and to mitigate, as far as was compatible with the national interest, the hardships created. Such work as the handling of licences, the allocation of import quotas and the fair distribution of supplies was undertaken by some of the larger chambers on behalf of the government.

These activities, however, involved no loss of independence, and chambers retained throughout their right to criticize—a right exercised, however, with a sense of responsibility and an appreciation of the nation's interest. The closer and more constant contact with government departments in fact strengthened the chambers' ability to present their members' views effectively in the proper quarter.

The third trend followed from these contacts—a greater inclination on the part of departments, and to some ex-

tent the government itself, to regard chambers of commerce as representative of commercial and industrial interests as a whole. For some purpose the body speaking for a particular trade would be the obvious organization to consult; for many others it remained desirable to seek a wider and more balanced view, comprising all sections of the business community. This chambers of commerce could provide, for they included manufacturers and merchants, home and export interests, small firms and the largest corporations.

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Chandler, Albert Benjamin

Chandler (1898—), U.S. legislator and baseball commissioner, was born July 14, 1898, in Corydon, Ky., and served in the U.S. army in 1918. A graduate of Transylvania college (1921), he later studied at Harvard university, received his LL.B. degree from the University of Kentucky (1924), and then practised law at Versailles, Ky. Elected to the state house of representatives in 1929, he was lieutenant governor of Kentucky, 1931–35, and governor, 1935–39. He resigned the governorship in Oct. 1939 to fill a vacancy in the U.S. senate and was elected for a full six-year term in November 1942.

Chandler, who had played semi-professional baseball in his youth with several small teams, was unanimously selected (April 24, 1945), by the owners of the 16 major league baseball clubs for the office of baseball commissioner after the death of Kenesaw Mountain Landis.

Channel Islands

This group of islands in the English channel belongs (except the Iles Chausey) to Great Britain. Area 75 sq.mi. Chief towns: St. Helier, St. Peter Port, St. Anne. Languages, English and French. Pop. (1946) 79,055. For purposes of government the islands were divided into (1) Jersey, and (2) the bailiwick of Guernsey, including Alderney, Sark, Herm and Jethou. Lieut. governors of Jersey during the decade 1937-46 were: Major General H. de C. Martelli (May 28, 1934-Dec. 12, 1938); Major General James Murray Robert Harrison (Dec. 12, 1938-June 7, 1940); Lieut. General Sir Arthur Edward Grassett (after Aug. 25, 1945). Lieutenant governors of Guernsey were: Major General E. N. Broadbent (June 5, 1934-Dec. 12, 1938); Major General Alexander P. D. Telfer-Smollett (Dec. 12, 1938-June 7, 1940); Major General J. R. M. Minshull-Ford (appointed June 7, 1940); Lieut. General Philip Neame (after Aug. 25, 1945).

The Channel Islands were the only British possession occupied by the Germans during World War II. Though already demilitarized, the islands were bombed and machine-gunned by the Germans on June 28, 1940, and many people lost their lives. All the islands were occupied from June 30, 1940, to May 9, 1945, when 30,000 Germans surrendered to the British.

In 1942 the Germans deported from the islands to internment camps in Germany, people of all ages and classes numbering 1,186 from Jersey, 800 from Guernsey and 64 from Sark, and including all retired British naval and military officers up to 69 years of age. Most of these persons returned to the islands. A small number died in the camps. Thousands of foreign workers were brought over by the German organization Todt to construct roads, tunnels, sea walls and fortifications of all kinds. They were all deported after the war.

The food supplies were very precarious during the German occupation, many substitutes being employed,

such as bramble leaves, green pea pods and seaweed; finally in Jan. 1945 the International Red Cross sent a ship with supplies for the islanders. The Germans had carried out large-scale fortifications and mined large areas of land which considerably affected the agriculture, in some places permanently. The famous cattle of the islands remained in their purity of breed, though depleted in numbers. By the summer of 1946 the islands had made a remarkable recovery and all visible signs of German occupation, except for a few gun emplacements, had been removed. The British government offered a capital sum of £4,200,000 to Jersey and £3,300,000 to Guernsey for liquidating part of their debt, and it was also arranged that the balance of the expenditure required for reconstruction purposes (some £7,500,000 for Jersey and some £6,000,000 for Guernsey) would be borrowed by the islands.

In Sept. 1946 a committee of the privy council, which had been appointed at the request of the islanders to inquire into reform of the constitution of the "states" of Jersey and Guernsey, spent a week in the islands hearing witnesses. Reforms urged by the Jersey Labour party, Communist and other parties were, briefly, that the states (parliaments) should be more democratic: that the position, in particular, of the rectors of parishes and the jurats (elected judges for life), who held seats by virtue of their office, should be reviewed and more seats allotted to elected representatives. The position of the jurats who both made the laws and administered them was considered anomalous. The question of changing the official language from French to English was also raised, and in Guernsey a royal court subcommittee suggested in Sept. that the change-over should be gradual and that exceptions, such as the Lord's Prayer and the Clameur de Haro, the traditional form of protest against grievances, should be made.

King George VI and Queen Elizabeth visited the islands on June 7, 1945. A committee of the privy council visited the islands in August to assist in revising the constitution of the states.

In July the Guernsey states agreed to purchase the island of Herm from the British government at a cost of £15,000.

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(S. M. HY.)

Chapultepec, Act of

See Pan American Conferences, 1937-46.

Charles, Prince of Belgium

Prince Charles of Belgium (Charles Théodore Henri Antoine Meinrad, Count of Flanders) (1903—), was born Oct. 10, 1903, in Brussels, brother of Leopold III, king of the Belgians. Shortly after Allied troops entered Belgium in the fall of 1944, partly liberating the country, Prince Charles was appointed (Sept. 20, 1944) regent by a joint vote of parliament.

After Leopold's release by Allied troops from German custody in May 1945, his return to the throne was approved by the Catholic party, but was opposed by the Liberal, Socialist and Communist parties, and Charles continued to serve as regent.

Charles Hayden Foundation

See Societies and Associations.

Chautemps, Camille

Chautemps (1885-), French politician, was born in Paris. After his admission to the bar, he practised before

the court of appeals and joined the Radical-Socialist party. Later he was elected a deputy for the Indre-et-Loire department; he was a senator representing Loire-et-Cher department from 1934 to the downfall of France in 1940. After holding a number of cabinet posts, Chautemps was premier for 24 hours in 1930 and was again premier in Nov. 1933. In early 1934, he was linked with the Stavisky case by the fact that his brother-in-law, Justice Pressard, who had been compromised in the scandal, committed suicide. His government fell in Jan. 1934 and he returned to the senate. In June 1936 he was minister of state in Léon Blum's Popular Front government. After the fall of the Blum regime the next year, Chautemps once more became premier. The Chautemps regime itself fell in March 1938, and he was then given cabinet posts in the succeeding Daladier government.

Chautemps was one of the sponsors of the Pétain government which concluded the armistice with Germany in June 1940; the following Nov. he went to Washington as Pétain's personal representative. He soon disassociated himself from Vichy and remained in the U.S. capital as a "private citizen." In 1944 the Radical-Socialist party expelled him from its ranks. He returned to France after its liberation and in Aug. 1945 denied Paul Reynaud's accusations that he had conspired to halt French resistance in 1940.

Cheese

Total production of cheese in the United States in 1937 was 648,825,000 lb., near the average for the preceding ten-year period. The output increased slowly until 1940, when it rose to 785,490,000 lb. and in 1942 to a record of 1,112,314,000 lb. The big increase was in American whole milk or Cheddar type, which increased from 492,041,000 lb. in 1937 to a record of 916,850,000 lb. in 1942. Other types of importance in 1942 were American-made Swiss, 52,561,000 lb.; cream cheese, 47,554,000 lb.; Italian varieties, 34,916,000 lb., and brick, 19,588,000 lb. The increase in Cheddar was stimulated to supply British needs through lend-lease and in the other varieties to supply the demand formerly supplied by imports from Europe. U.S. manufacturers began to produce the European types to a larger extent than ever before.

Production of Cheese in the U.S., 1937-46

						(în Po	unds)						
1937		٠				648,825,000	1942						1,112,314,000
1938						725,325,000							993,294,000
						708,527,000							1,016,000,000
						785,490,000	1945		٠				1,115,000,000
1941	•		٠	٠	•	956,161,000	1946	٠		٠	٠		1,050,000,000

U.S. cheese makers had to compete for milk with the rapidly growing dried-milk industry and in 1942 the government established a subsidy of 3.75 cents per lb. for American cheese. The demand for fluid milk and butter pressed upon cheese production in 1942 and 1943, causing a decline in cheese output. Rationing was invoked to save supplies for the military forces and lend-lease, but only the scarcity of the product in the markets was effective in reducing civilian consumption. Civilian consumption averaged 5.5 lb. per capita in 1935-39 but did not increase in total production; the average for 1945 was only about 5.7 lb. per capita. The end of military buying in 1945, together with the 10% increase in total production in 1945, brought about a slight increase in 1946, to a per capita production of about 6.5 lb. The meat shortage stimulated the demand for cheese in late 1945 and in 1946.

Cheese consumption was 8.6 lb. per capita in Great Britain in 1937 and was also much higher in all Euro-



Cases of Cheddar cheese being inspected by an official of the U.S. department of agriculture in 1941 before shipment to Great Britain under terms of the lend-lease act

pean countries than in the U.S. World War II upset world trade and made it difficult for Great Britain to get imports from New Zealand, which led in exports. Canadian cheese production was stimulated for the British market to help make up the loss of Dutch supplies. Considerable quantities of cheese were shipped to the U.S. from South America, principally from Argentina and Brazil. About one-third of the U.S. cheese supply was used for military and export purposes in 1944 though it was estimated that the domestic market would have absorbed all the supply had there been no restrictions.

World cheese production was sharply reduced during the war by the reduced output of milk in European countries where most of the cheese was made. Up to 1946 the recovery had been small, as breeding animals were scarce and most of the land was being planted to grains for human consumption. There was also the need for the people to consume the grains as food rather than feed them to livestock. (See also Butter; Dairying; Milk.)

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Chemical Therapy See CHEMOTHERAPY.

Chemical Warfare

The term "chemical warfare" is generally accepted as including those forms of warfare in which chemicals are directly employed, utilizing chemical action rather than mechanical energy to implement military operations. Notable examples are: poison gases, smoke-producing materials and fire-raising munitions. Under this category may also be included biological agents.

By 1937, increasing uneasiness arising from the unsettled international situation was causing military authorities of all major powers to re-examine the possibilities of chemical warfare, which had first been exploited under modern conditions during the years 1915–18.

Gas Warfare.—Peacetime popular opinion among nonmilitary nations was on the whole averse to the use of poison gas, much as the ordinary individual in such nations was averse to war itself. Military opinion on the subject in the U.S. and the British empire was somewhat mixed; there was some scepticism as to the relative value of gas as a weapon, although U.S. chemical resources were seen to place the U.S. in an enviable position in this field. However, lack of appropriations had prevented extensive research looking to discovery of materials more toxic than those already available; e.g., dichlorodiethyl sulphide (mustard gas), chlorovinyl dichloroarsine (lewisite) and carbonyl chloride (choking gas).

In Germany, one new gas had been discovered, somewhat accidentally, and was undergoing experimentation. Shell and bomb filling plants were being developed for rapid loading of gas munitions and sizable stocks were beginning to accumulate. However, the impetus of German research in 1937 was being directed toward objectives which the nazis believed to be more promising of results in the wars they were planning. The Japanese had developed no new gas agents, nor did they do so during the ensuing war years.

Most nations, with the notable exception of the U.S., had subscribed to international agreements to abstain from the use of poison gas in war. Although the U.S.A. was not party to such agreements, the nation's policy in this direction had been clearly announced and was in line with that formally accepted by other powers; in short, there was in existence what amounted to a principle of international law that no nation would employ gas as a weapon unless forced to do so as a retaliatory measure.

Nevertheless, the looming threat of aerial attack which overhung Europe during the years preceding World War II carried with it considerable apprehension as to gasladen bombs. This had led to initiation of extensive programs for providing civilians with gas masks and other devices for protection against gas attack. Generally speaking, both soldiers and civilians in areas sensitive to attack were trained and equipped to withstand war gases.

The initiative as to gas attack remained with the axis powers throughout the war years. The reasons why this form of attack was never resorted to (except for sporadic instances of small-scale employment by the Japanese on the Asiatic mainland) were fairly clear.

The German government, under direction of Hitler, regarded gas as a secondary weapon which was to be brought into play only in retaliation against Allied employment. That this would have been done is evidenced by the fact that undestroyed stocks of war gases captured in 1945 were found to exceed considerably the total amounts produced by Germany during the years of active gas warfare, 1915–18.

It was difficult if not impossible to determine exactly the motives that led to this decision to keep such a valuable military weapon in the background. It was true that gas had little tactical value in conjunction with the blitz-krieg methods on which the Wehrmacht relied so heavily for victory. For the aerial attack of London, the Germans had in reserve an incendiary bomb which they thought to be surpassingly effective. When Germany was finally thrown on the defensive, the luftwaffe had become a weak instrument, leaving German cities vulnerable to aerial gas attack by superior Allied force.

Repeated warnings by heads of the British and U.S. governments that retaliation in gas would be prompt and overwhelming certainly played a part in checking inclination to bring forward the gas weapon. This was a matter of some concern to Tokyo, and specific instructions were issued by the Japanese emperor that no field commander was to release gas without specific authorization.

Although poison gas was not brought into action during World War II, some tactical concepts as to its employment had necessarily to be modified because of advances in other fields of military technique during the ten eventful years. For example, the cloud gas form of attack, involving release of a gaseous agent from stationary containers, was later seen to be obsolete because more effective results could be obtained by use of large aerial bombs. Increasing likelihood of applying gas warfare through the air forces tended to emphasize gas as a strategic rather than a tactical weapon.

Reviewing the gas situation as it existed at the close of hostilities in 1945, Allied authorities considered that they had scored a victory in the field of gas warfare inasmuch as their announced policy of avoiding the use of gas had been sustained, but only by intensive preparations on their part for both offense in, and defense against, this type of chemical agent. Proof that such a potentially deadly weapon could be held in check by realistic preparedness was not without possible significance in considering the future of atomic warfare.

Chemical Smoke.—Use of smoke for blinding an enemy or obscuring friendly troops was an old technique. In 1937 many armies, notably that of Germany, included units specially equipped to put down smoke screens. Standard methods included firing of smoke shells, use of smoke pots, dropping of aerial smoke bombs and release of smoke-producing agents from tanks carried by low-flying aircraft.

The advent of large-scale strategic bombing developed an urgent requirement for smoke to conceal important ground targets from aerial attack. Need for obscuration over wide areas and for extended periods of time constituted a demand different from that which had previously been met with tactical munitions.

To satisfy this requirement, mechanical smoke generators were developed and put into use by 1941. As finally perfected, these generators were capable of processing boiling hydrocarbon oil into aerosols of high obscuring power and considerable persistency. They found particularly effective use in Europe in preventing aimed bombing of harbour installations and in covering river crossings. For tactical use, lightweight, easily portable units of smaller capacity were supplied.

In both tactical and strategic missions smoke was more widely used between 1943 and 1945 than ever before. By the end of hostilities it had become practically an "on call" weapon of air as well as ground forces. Much of this increased usage could be attributed to the ease of production and general effectiveness of fog generated from oil.

Besides obscuring smokes, always most effective in white or gray tones, an interesting new development of the decade was the introduction of coloured smokes for use in signalling. They appeared in a variety of hues, permitting selection of colours in distinct contrast to local terrain; they could be discerned from great distances.

Biological Warfare.—Use of germs or bacteria in war had excited the imaginations of scientists for many years. In 1937 it was known that the possibilities of this type of warfare were being quietly explored in many directions. Numerous practical limitations to the employment of bacteriological agents, however, were recognized. On the other hand, the idea of weakening a prospective adversary well in advance of active hostilities by the insidious introduction of germs to destroy either animal

or vegetable life presented a hazard too real to be over-looked.

As a result, research in biological warfare during World War II was actively pursued by the leading belligerents with emphasis on means for detecting evidence of this type of attack and of checking its effectiveness. There was no authenticated instance of the use of bacterial agents during the war.

At the same time, there was no assurance that they would not be introduced in future wars except insofar as reasonable preparedness might serve to deter their employment. (See BIOLOGICAL WARFARE.)

Incendiaries.—The incendiary weapon proved to be the outstanding development of chemical warfare during this period (See Incendiary Warfare.) It was used in such prodigious quantities and contributed so heavily to the weakening of the axis powers that, except for the introduction of the atomic bomb, it would have rated as the outstanding new weapon of World War II. (See also Munitions of War; Tactics of World War II; World War II.)

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Chemistry

Out of the vast array of chemical developments which appeared during the decade 1937–46, a few fields stood out prominently; namely, hydrocarbons, synthetic plastics and high polymers, structure of natural products, new medicinals, carbohydrates, inorganic chemistry, nuclear chemistry and new atoms.

Developments in hydrocarbon chemistry included gasoline by polymerization, mechanisms in pyrolytic reactions, catalytic cracking, nitration, butadiene, synthetic rubber and production of thiophen. New plastics included polystyrene, nylon, saran, plexiglas, polyvinyl butyral, allyl plastics such as CR-39, allylstarch, vinyon, ethylcellulose and many others. Natural products extensively studied were steroids, vitamins B₁, B₆, E, K, marijuana, biotin, cork, pantothenic acid and dicoumarin. High in the list of medicinals developed during this period were the sulfa drugs, antimalarials, penicillin and streptomycin. Nuclear chemistry had a spectacular growth, dealing as it did with deuterium or heavy hydrogen, uranium 235, new atoms such as plutonium and the atomic bomb. These topics will be developed in turn.

Hydrocarbons

Gasoline by Polymerization.—When kerosene lamps were in vogue, before the day of the automobile, the problem of the petroleum refiner was that of increasing the kerosene output at the expense of the gasoline. With the disappearance of lamps and the advent of automobiles this situation became reversed. The supply of straight run gasoline became increasingly less adequate until finally the "cracking process" came to the rescue. As is well known, the mineral oils, which are represented as large hydrocarbon molecules, may become broken down into smaller, more volatile hydrocarbons by high temperature methods of "cracking" or pyrolysis. To illustrate, an oil which is too nonvolatile for motor fuel might contain 18 carbon atoms per molecule. On cracking, it might break into two smaller

molecules of nine carbon atoms each. This smaller hydrocarbon would be in the satisfactory boiling point range for acceptable gasoline. It would be satisfactory also if the C_{18} broke into $C_{10}+C_8$ units or even three C_6 units, but the trouble is that much of the pyrolysis gives rise to still smaller units which are gaseous and hence just as unfit for purposes of gasoline as the original oil. Various uses for the gas were devised, but to a large extent it was used merely as fuel for the refinery furnaces.

It had been recognized for years that a major problem was that of recombining the smaller, gaseous hydrocarbon units into gasoline. Thus, if two C_4 units (butylene) could be welded together, a C_8 molecule (octylene) would result. Similarly, three C_3 units (propylene) could be visualized as the precursor of a nonylene (C_9H_{18}). This process became known as polymerization.

Although polymerization of olefines was not new, the industrial application of it did not appear until 1937. In one installed process, yields of 3.3 to 10.9 gallons of gasoline were realized per 1,000 cu.ft. of cracked gases which contained 18% to 69% of propylene and butylene. V. N. Ipatieff and co-workers were particularly active in this development. They found that phosphoric acid was very effective in promoting the polymerization. Phosphoric esters, the addition products of the acid and olefine, were formed first; e.g., isopropyl dihydrogen phosphate, H₂PO₄C₃H₇, from propylene. At the temperature of the reaction involved (100°-200° C.), two such molecules are considered to interact, regenerating the phosphoric acid (2 H₃PO₄) and forming one molecule of hexylene, C₆H₁₂. By continuing the same mechanism, the C_6H_{12} may change further to C_9H_{18} or $C_{12}H_{24}$. One feature about the polymer gasoline is its high antiknock rating. Such is the case because the carbon skeletons of the hydrocarbons produced are necessarily branched-chain, not straight-chain.

Mechanisms in Thermal Decompositions.—The preceding years had witnessed a remarkable development in understanding what goes on "behind the scenes" in organic reactions, especially in reactions of pyrolysis. Tangible evidence for at least three mechanisms had been demonstrated, two of which were reported by C. D. Hurd and collaborators in 1938. A semi-ionic mechanism was shown to apply for the thermal rearrangement at 200°-250° C. of unsaturated ethers into phenols, or the related rearrangement of allyl vinyl ether into allylacetaldehyde. A mechanism involving a hydrogen bridge accounted satisfactorily for the pyrolysis at 400°-500° C. of esters into acids and olefines. The absence of other products such as aldehydes was evidence that preliminary scission of the ester into unstable parts or radicals could not apply. Such a mechanism did apply, however, in the decomposition at 550°-700° C. of such compounds as paraffin hydrocarbons. The radicals, formed initially, generally do one of two things: decompose further into an unsaturated compound and a smaller radical, or react with the surrounding molecules of the original substance.

In the last type of mechanism it is important to know the strength of bonds between atoms, because the initial split should come at the point of greatest weakness. F. O. Rice approximated the strength of the bond which breaks by finding the "activation energy" involved in the pyrolysis. The activation energy plus the average energy of the molecules at the temperature of decomposition gives a satisfactory measure of the strength of the linkage which breaks. Experimentally, this activation energy was determined by passing the vapours of the compound rapidly through an evacuated tube heated to different measured temperatures and noting the time required to remove a

standard metallic mirror of antimony by its combination with the reactive radical and subsequent volatilization. Since this time of removal depends on the concentration of radicals at that point it is related also to the rate of dissociation of the original compound. If, therefore, the experiment is performed at two or more temperatures, the activation energy may be calculated.

As would be expected, there was considerable variation in the strength of various bonds. That between carbon and oxygen (in methyl ether) was stronger than the one between carbon and nitrogen (in trimethylamine). The former was 81,100 calories and the latter 50,800. The carbon-to-carbon bonds in ethane, propane and heptane respectively were 79,500, 71,500 and 63,200 calories. This demonstrated a definite lessening in stability in passing from the lower to the higher members of the family of saturated hydrocarbons. G. B. Kistiakowsky observed a similar diminution of activation energies in the pyrolysis of tertiary butyl and tertiary amyl alcohols. The former 4-carbon alcohol gave 65,500 calories, whereas the latter 5-carbon alcohol gave 60,000. Generally, activation energies of 50,000-80,000 calories may be expected for such decompositions in the aliphatic series.

Subsequent reactions of the radicals proceed in the direction of lower activation energies. The methyl radical (CH₃), once formed, is prevented from changing into a methylene radical (CH2) because at least 100,000 calories would be required. Other radicals such as ethyl, propyl, etc., may decompose readily enough. Only 49,000 calories are required to change ethyl (C₂H₅) into ethylene (C₂H₄) and atomic hydrogen (H). Still smaller energies are required for higher radicals. Even smaller energies are required for the radicals to appropriate hydrogen from neighbouring molecules on collision with them. Thus, the reaction: methyl+ethane (C2H6) to produce methane (CH₄)+ethyl requires only 20,000 calories. A similar energy requirement is involved in the change of atomic into molecular hydrogen (H to H2) by collision with ethane.

New radicals are set up by these collisions and a chain of reactions is inaugurated. Such a reaction mechanism implies that pyrolyses could be induced at temperatures considerably below the ordinary decomposition temperature if only some supply of radicals was present. This implication was substantiated in A. O. Allen and Darrell V. Sickman's work on acetaldehyde, and in Paul Cramer's work on hydrocarbons. It happens that acetaldehyde is stable at 300° C. whereas azomethane gives rise to methyl radicals at that temperature. A mixture of acetaldehyde and azomethane was heated to 300° C. with the result that a normal type of pyrolysis of the aldehyde was obtained. Hence, the methyl radicals must have initiated the breakdown of the acetaldehyde.

High-Test Gasoline.—Improvement of the quality of motor fuel was an outstanding achievement of U.S. chemists during the decade. The standard by which such fuels were evaluated was 2,2,4-trimethylpentane, an octane which was arbitrarily assigned a value of "100 octane" in the fuelrating scale. Important milestones in this phase of petroleum technology were thermal cracking or pyrolysis, the use of tetraethyl lead, catalytic cracking and the alkylation by gaseous unsaturated hydrocarbons of paraffins such as isobutane or aromatic hydrocarbons such as benzene. The alkylation process may be illustrated by the formation of:

(a) 2,2-dimethylbutane from ethylene and isobutane at 480° C. and 1,000 lb. per square inch; (b) isopropyl benzene from propylene and benzene, with suitable catalysts;

(c) 2,2,3-trimethylpentane from 1-butene and isobutane, in

the presence of concentrated sulphuric acid. Substances a, b and c all contributed to the excellence of aviation gasoline; each possessed a rating of 90–98 octane or better.

The hydrocarbon with the highest octane rating is trimethylbutane (CH₃)₃CCH (CH₃)₂, one of the heptanes known as "triptane." Trimethylbutane is not a new chemical. It had also been known for years that it possessed at least a 50% greater power output than 2,2,4-trimethylpentane, but until 1943 it had been impossible to acquire any sizable quantity of it because of prohibitive costs. A new method was announced late in 1943 by V. N. Ipatieff and V. Haensel of the Universal Oil Products company which was claimed to bring its price below \$1 per gallon. By the end of the decade, however, this material had not been produced industrially.

Fluid Catalytic Cracking.—Reference should be made to a new type of powdered catalyst announced in 1943 for converting gas oil into unsaturated gaseous hydrocarbons. Such a catalyst was used by the Standard Oil Company of New Jersey in its plant at Baton Rouge, La., and by several other petroleum refineries. The catalyst is so fine that it behaves like a fluid and the process is referred to as fluid catalytic cracking. Handling a solid in a manner similar to a fluid is a radical departure from previous industrial practice, and increased production of gasoline with less difficulty was achieved as a result.

Aluminum Bromide Catalysis.—Work initiated by P. A. Leighton and J. D. Heldman at Stanford university, Calif, and continued by Julius Heldman at the University of California gave important evidence on the catalytic isomerization of paraffin hydrocarbons in the presence of aluminum bromide or aluminum chloride. Aluminum bromide is the more powerful of the two, which may be correlated with the fact that butane dissolves aluminum bromide but not aluminum chloride. If either one of the aluminum salts is perfectly pure no reaction occurs, but traces of hydrogen chloride or hydrogen bromide as purposeful impurities suffice to promote the catalysis. Because of this Heldman believed that the true catalyst is the AlBr₄-ion (formed from AlBr₃+HBr).

An ingenious mechanism was proposed to explain the isomerism, the main feature of which is an assumption that the tetrabromoaluminum ion possesses a co-ordination number higher than four, and that it behaves both as an acid and a base. In coming near to the butane molecule (CH₃CH₂CH₂CH₃) it acts as an acid and attracts a terminal methyl group (CH₃) as a negative ion. Concurrently it acts as a base by attracting a hydrogen positive ion from the no. 3 carbon of the butane skeleton thereby leaving a 3-carbon fragment (CH₂–ČH–CH₃) from the butane. Readjustment of electrons within this fragment (to ČH₂–ČH–CH₃) paves the way for the addition of the H⁺ and CH₃– to produce isobutane, CH₃CHCH₃

 CH_3

Interaction of isobutane with an unsaturated hydrocarbon such as ethylene is also catalyzed by aluminum chloride and hydrogen chloride. This reaction had been known for some time, but L. Schmerling's (Universal Oil Products Co.) mechanism was the first one to explain the facts satisfactorily. If isobutane ([CH₃]₃CH), ethylene (CH₂=CH₂) and a little hydrogen chloride are the three starting materials, the first step is an addition of hydrogen chloride to the ethylene, after which the ethyl chloride so produced reacts with isobutane to form tertiary butyl chloride ([CH₃]₃CCl) and ethane (CH₃CH₃). In the next step, the

t-butyl chloride adds to ethylene. In the final step, this addition product ([CH $_3$] $_3$ CCH $_2$ CH $_2$ Cl) reacts with isobutane somewhat as ethyl chloride did in the first step to form t-butyl chloride and 2,3-dimethylbutane ([CH $_3$] $_2$ -CHCH[CH $_3$] $_2$).

P. D. Bartlett et al., of Harvard university studied a similar problem, namely, the catalyzed (AlBr₃) exchange of halogen and hydrogen atoms. In an experiment involving t-butyl chloride, isopentane and aluminum bromide, for example; an almost instantaneous (0.001 sec. or less) reaction took place giving rise to isobutane and t-pentyl bromide. With longer periods of contact some of the latter rearranged to 1-methylisobutyl bromide. A positively charged tertiary butyl ion was regarded as the important feature of the mechanism:

 $(CH_3)_3CCl + AlCl_3 \rightarrow (CH_3)_3C^+AlCl_4$

H. Pines and R. C. Wackher (Universal Oil Products Co.) added the interesting observation that isomerization of butane occurs only if a trace of water or oxygen, or olefine is present, even when hydrogen bromide accompanied the AlBr₃. These compounds may be necessary in helping to form the carbonium ions which are apparently required to promote the reaction.

Toluene from Petroleum.—The fact that petroleum companies had become important producers of chemical raw materials was witnessed by the modern development of toluene, butadiene, thiophene and mitroparaffins from petroleum hydrocarbons. Demand for toluene during wartime is always heavy because it is the source of T.N.T. The annual U.S. production of toluene in 1918 was 15,-000,000 gal., obtained almost entirely from coal tar. By 1939 the output was 30,000,000 gal., but in 1944 the quantity had skyrocketed to 250,000,000 gal. The increase came chiefly from petroleum sources by three methods: (1) about one-fifth by recovery of naturally occurring toluene from straight run and cracked naphthas; (2) about seventenths by dehydrogenation of methylcyclohexane, which occurs to the extent of 30%-40% in feed stock from Texas petroleum. This was the "hydroforming process" of the Standard Oil Co. of Indiana; (3) about one-tenth by AlCl3isomerization of dimethylcyclopentane (made from light gasoline and aluminum chloride) to methylcyclohexane, then dehydrogenating the latter. This process was developed by Shell Oil Co.

Two catalysts reported to be effective for the dehydrogenation of methylcyclohexane were molybdena-on-alumina, which is regenerated with air every four hours (to burn off the deposited carbon), and nickel-tungsten sulphide, which is regenerated with hydrogen semiannually. The first of these catalysts was used in the hydroforming process, conditions for which were 540° C. and 250 lb. pressure. The magnitude of the installation may be appreciated somewhat by pointing out that the cost of catalyst per charge was \$400,000, such a charge being effective for about seven months.

The toluene as produced was mixed with paraffins, cycloparaffins and olefines. Separation from this mixture was a major problem. The problem was solved by use of two new techniques: (1) extractive distillation with phenol, the latter clinging to the toluene more than to the paraffins; (2) azeotropic distillation with methanol or methyl ethyl ketone. Distillation towers as tall as an eight-story building were used in these steps, and toluene of 99% purity was obtained.

Synthetic Rubber.—The year 1940 witnessed a remarkable development in the technology of rubberlike materi-

als. Rubber itself is a hydrocarbon, the molecules of which are of gigantic size compared with molecules of simple hydrocarbons such as pentane, acetylene, benzene or naphthalene. In spite of its vast size, consideration of the structure of the jubber molecule reveals a simple pattern. It is merely a collection of about 2,000 small methylbutadiene or isoprene molecules joined end to end.

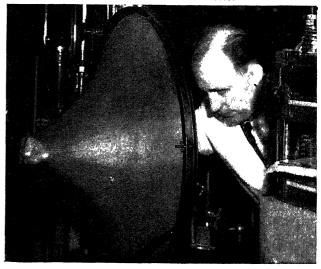
Experimentally, one may convert methylbutadiene, a low-boiling liquid, into rubber by leaving it in contact with metallic sodium. No convenient source of methylbutadiene was known in 1940, however.

Butadiene and chlorobutadiene do have convenient sources, so they provide good starting materials in the synthesis of rubberlike products. Both may be made from vinyl acetylene (C_4H_4) which, in turn, is made by causing acetylene (C_2H_2) to double up with itself in the presence of copper salts. Addition of hydrogen chloride yields chlorobutadiene (C_4H_5 Cl), whereas insertion of hydrogen yields butadiene (C_4H_6). Butadiene may be made also by catalytic subtraction of hydrogen from butane (C_4H_{10}) or butene (C_4H_8), but these are available only in petroleum-bearing countries.

The "rubber" made from chlorobutadiene had been marketed in the United States after 1932 under the name of Neoprene. The buna rubbers, which had been developed somewhat in Germany, were even newer. Their manufacture involves butadiene and another unsaturated substance. Buna-S, later named GR-S, incorporates butadiene and styrene. Buna-N and perbunan are made by the copolymerization of butadiene and acrylonitrile (vinyl cyanide). Buna-N and Neoprene resist the swelling action of gasoline far better than ordinary rubber does. Buna-S possesses better abrasion resistance than rubber itself, making it especially valuable for treads of tires. It is noteworthy that these desirable properties arise from the introduction of some other unit to participate in a "cross-polymerization" with the butadiene. An undesirable quality of this kind of rubber is its tendency to heat on flexing.

A related butadiene development of 1940 was announced by W. L. Semon of Goodrich Rubber Co. A co-polymer was made from butadiene and other substances such as those named above by first emulsifying the mixture with soap, then heating. The ingredients react to form a liquid similar in appearance to rubber latex and similar also in the manner of processing.

"Butacite," a plastic layer for safety glass characterized by extreme flexibility under impact, made its appearance on 1940 motor car models in the United States





First synthetic rubber factories approved by the U.S. government after Pearl Harbor began production in 1943. A sample is shown being cut from a cube of synthetic rubber

Butyl rubber was another achievement of 1940. It was announced by P. K. Frolich and co-workers of the Standard Oil Development Co. (N.J.). As before, butadiene was used, but not as the chief ingredient. Essentially this rubberlike material is made by polymerizing olefines. Only a small amount of butadiene (a diolefine) is added. As a matter of fact, the olefine gas isobutylene may be polymerized without butadiene to yield a "polyisobutylene" which is rubberlike because the molecules in the polymer consist of 500 to 5,000 isobutylene units. This polyisobutylene is essentially a saturated hydrocarbon, inert toward ozone, nitric acid or sulphur and hence incapable of vulcanization. If just enough butadiene gas is mixed with the original isobutylene gas to provide for sufficient unsaturation in the polymerized mass so that it can be vulcanized, the resulting product is butyl rubber. When cured, it is devoid of unsaturation and is as inert chemically as the polyisobutylene. It is more stretchable, however, than the rubber from trees. Butylrubberserves excellently as the material for inner tubes.

Isobutylene is a gas produced during the cracking of petroleum. It may be prepared also by pyrolysis of isobutane, an important ingredient of natural gas. Normal butane, also in natural gas, may be rearranged into isobutane by appropriate catalysts at high temperatures, and in the presence of other catalysts it may be changed by dehydrogenation into butadiene. Thus, natural gas and petroleum became materials for a new synthesis of rubber.

World War II was responsible for an unprecedented development in synthetic rubber, primarily of the butadienestyrene variety. The first plants to get into operation produced butadiene from alcohol. A mixture of alumina and zinc oxide was proposed as a suitable catalyst for this reaction. About a year later this process was supplemented by the procedure for making butadiene from petroleum.

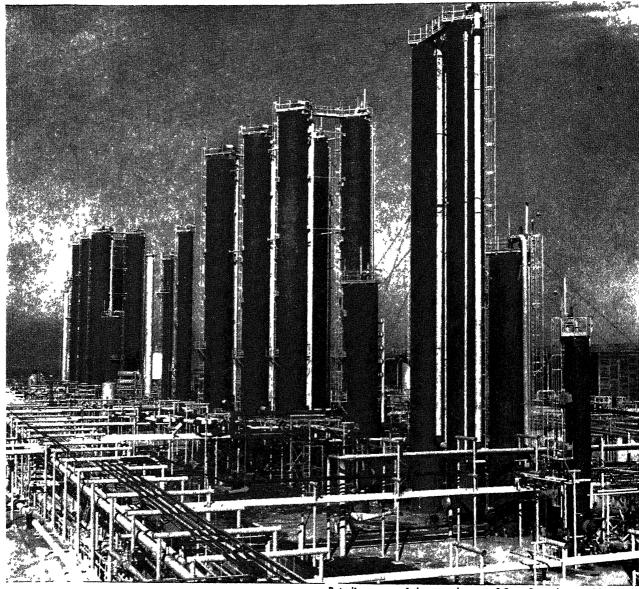
The steps employed in converting butadiene into syn-

thetic rubber briefly are these: (1) mix butadiene with styrene and emulsify the mixture in water in the presence of soaplike substances; (2) add a polymerizing agent such as benzoyl peroxide to the emulsion, and heat while stirring for 10 or 15 hours at 60° C.; (3) coagulate this synthetic rubber latex by addition of acetic acid or salt solutions; (4) collect the coagulated material and work it up on a rubber mill.

During 1945 synthetic rubber plants in the United States for government rubber containing styrene (GR-S) had an estimated capacity of 1,000,000 tons. In contrast, the best German annual production was about 17,000 tons. About one-third of the butadiene for the U.S. production came from alcohol, the remainder from petroleum. Butadiene from petroleum might cost 6.4 cents per lb., whereas that from alcohol was estimated at not less than 9 cents.

Refinery gases, the butanes and butylenes, were the chief source materials. The undesired isobutylene was selectively polymerized by sulphuric acid into diisobutylene, useful for aviation gasoline. The desired 1- and 2-butenes were separated from the butanes by azeotropic distillation with furfural or acetone through huge columns containing 75 bubble trays, a column being on the order of 200 ft. high and 13 ft. in diameter. These butenes, mixed with steam to give a hydrocarbon partial pressure of 1 to 2 lb. per sq.in. absolute, were passed over a catalyst at 620° C. The conversion to butadiene per pass was about 25%, and separation of the butadiene was by means of azeotropic distillation with furfural or extractive distillation with cuprous ammonium acetate. The catalyst, as yet undisclosed in 1946, was regenerated periodically with hot steam which removed the carbon as carbon monoxide.

Conversion of butane to butadiene may follow either a two-step (butane to butene to butadiene), or the Houdry one-step process. Two plants were using the latter in 1945. The process called for a chromia-alumina catalyst at 595° C. and 1.5-lb. pressure. Every 7 to 15 minutes the carbon deposit on the catalyst burned off with air.



Butadiene, one of the co-polymers of Buna-S synthetic rubber, was produced from normal butane in 1945, at this U.S. government-owned plant operated by Phillips Petroleum Co.

Other Rubberlike Products.—During the rubber shortage of World War II many materials unlike rubber chemically, but with rubberlike properties, were developed. Thiokol was one such material. It is a reaction product of sodium polysulphide and ethylene chloride. This was the most oil resistant of the rubbers. Koroseal, another rubberlike substance, was made by polymerizing vinyl chloride and incorporating a suitable plasticizer such as tritolyl phosphate.

Industrial Production of Nitroparaffins.—Nitroparaffins such as nitromethane or nitropropane had been known for many years but had been curiosities, hard to prepare and with no uses. Then laboratory experiments by H. B. Hass at Purdue university, Lafayette, Ind., showed that these substances could be made by direct nitration of the hydrocarbons in natural gas, if performed at elevated temperatures in the vapour phase. Production of nitroparaffins industrially was started during 1941 by Commercial Solvents corporation in their plant at Peoria, Ill. In view of the cheapness and availability of natural gas as a raw material in 1941, and in view of the remarkable properties of the nitroparaffins, this development represented an important milestone in industrial chemistry. Nitromethane, CH₃NO₂, is a liquid whose boiling point is about the same as water.

Many uses for it as a solvent had been reported by 1946. The condensation of nitromethane with aldehydes in the presence of alkalis yields nitro alcohols. Formaldehyde, for example, yields trihydroxymethylnitro-methane (HOCH₂),-CNO₂. The trinitrate of this alcohol is valuable as an explosive. The properties of the esters of these nitro alcohols were reported in 1941 by John B. Tindall.

Nitroparaffins, although insoluble in water, dissolve readily in alkali. When chlorine is passed into such a solution, chloronitroparaffins are formed immediately. Trichloronitromethane is the well known chloropicrin.

Another reaction of nitroparaffins is their behaviour toward mineral acids; 1-nitropropane, for example, when treated with sulphuric acid changes into propionic acid and hydroxylammonium sulphate. This provided a cheap source of hydroxylamine for the first time, as well as an independent source of propionic acid.

Kenneth Johnson and E. F. Degering of Purdue university discovered that 80%-85% yields of propionalde hyde or butyraldehyde may be formed by adding the sodium salt of 1-nitropropane or 1-nitrobutane to cold,

dilute sulphuric acid. Coupling of the nitroparaffins with aromatic diazo compounds produced azo dyes, one such being phenylazonitropropane, $C_6H_5N=NC\ (CH_3)\ _2NO_2$. Such substances dye wool or silk directly and are applicable to cotton if the coupling is performed on the fabric.

An ingenious method of analysis for mixtures of nitroparaffins by infra-red spectroscopy was reported by J. R. Nielsen and D. C. Smith of the University of Oklahoma, Norman, Okla. The basis of the method was to find, from the spectra of the pure components (nitromethane, nitroethane, 2-nitropropane, 1-nitropropane) a set of wave lengths such that at each wave length only one component shows strong absorption while the others show weak absorption. For the four nitroparaffins mentioned, these bands were located, respectively, at 10.90, 10.06, 11.74, 8.15 microns. Only a few minutes were required for each analysis, and accuracy was within 0.1%. R. B. Barnes and co-workers of the American Cyanamide company were active in developing infra-red spectroscopy as a tool for the analysis and control of synthetic rubber.

Thiophene.—Search for a new method of making butadiene from butane guided chemists at the Socony-Vacuum laboratories to the discovery of a practical synthesis of thiophene. They reasoned that sulphur at sufficiently high temperatures might pull away the hydrogens of butane, to form butadiene and hydrogen sulphide. The reasoning was good because a substantial amount of butadiene was isolable under certain conditions, but the method proved to be much more attractive as a source of thiophene. A yield of 70% (by recycling) was obtainable by heating a mixture of one part of butane with 1.5 parts of sulphur at 650° C. for one-tenth of a second, followed by quick cooling. The conversion per pass was 20%–24% based on butane.

Thiophene, C₄H₄S, had been primarily of interest as the impurity (0.1%) in coal-tar benzene. It was fairly well studied in the six decades after its discovery, but never with anything but academic motives. Industrial utilization seemed assured at the end of the decade 1937–46.

Thiophene resembles benzene in that it displays conventional substitution reactions with bromine, chlorine, nitric acid, or sulphuric acid; but the greater reactivity of thiophene is noteworthy. Its reactions with mercuric salts, or ethylmagnesium bromide, or acid chlorides in the presence of stannic chloride all contrast to the corresponding nonreactions with benzene. F. S. Fawcett and H. E. Rasmusson, working with purer thiophene than was hitherto available, found its boiling point to be 84.1° C. and its melting point -38.5° C.

Synthetic Plastics and High Polymers

Plastics fall into two broad classes; those made from high molecular weight materials (cellulose acetate, cellulose nitrate, ethylcellulose) and those made from low molecular weight substances by reactions of polymerization or condensation. Ethylcellulose was introduced industrially during the decade 1937–46. Polyvinyl butyral is another plastic made from a high polymer, namely, from polyvinyl alcohol and butyraldehyde. Originally developed for use in laminated safety glass, its output served other purposes during 1942–44, such as waterproof raincoats.

Polyvinyl acetate illustrates the other group of plastic materials. Vinyl acetate, vinyl chloride and similar compounds of the structure CH₂=CHX are known to polymerize by opening of the double bond so that a chain of this nature is formed, -CH₂-CHX-(CH₂-CHX-)_n-CH₂-CHX-, in which n represents a large number. The end groups of these long polymer chains are usually not well understood, but the work of C. S. Marvel and G. E. Inskeep

of the University of Illinois, Urbana, Ill., gave new information on the structure of the end group of polyvinyl alcohol. This polymeric alcohol is produced by alkaline hydrolysis of polyvinyl acetate. During this process an irregular change was noted in the molecular weight of the polymer, which was explained by assuming that polyvinyl alcohol has one terminal aldehyde group, the structure of which may be visualized as –(CH₂–CHOH)_n–CH₂CHO. Under acid conditions this terminal aldehyde group can react with neighbouring hydroxyl groups, and under alkaline conditions the aldehyde function may condense with a similar function, giving rise to molecules of quite different molecular weight.

For polyvinyl chloride, X in the above structure is Cl; for polyvinyl acetate, it is OCOCH₃; for polystyrene, it is phenyl or C₆H₅; for methyl acrylate polymer, it is COOCH₃; for acrylonitrile polymer, it is CN; for the allyl polymers, it is CH2OR wherein R represents a vari ety of bifunctional radicals. Vinyon contains large amounts of polyvinyl chloride. Styron is polystyrene. Lucite and plexiglas are composed of methyl acrylate and methyl methacrylate polymers. The transparency of styron, lucite, and plexiglas is the basis for many uses. A "hardened" lucite, better for abrasion resistance, is made by incorporating a few parts of acrylic or methacrylic anhydride to the methyl methacrylate during its polymerization. Still more resistant to abrasion is the transparent allyl resin, CR-39, developed by Columbia Chemical division of Pittsburgh Plate Glass company. Saran, or polyvinylidene chloride, was a development of Dow Chemical company. It is made by polymerization of vinylidene chloride, $CH_2 = CCl_2$. The plastic is tough. Pipes of it may be welded readily by heating the ends to 175° C. Noncorrosive Saran screens came into use in 1945. Polyethylene (-CH2-CH2-) n is a high polymer, made by heating ethylene (C2H4) under very high pressure in the presence of a trace of oxygen.

Another large group of resins is made by condensing two different molecular species, usually by loss of water as the reaction progresses. Such resins include the alkyd type which start with phthalic anhydride and glycols, the phenolics such as bakelite, which are compounded from phenol and formaldehyde, the urea and melamine resins which also require formaldehyde, and nylon which is the polyamide resulting from interaction of a diamine with a dicarboxylic acid. These high polymers find wide application in varnishes, moulded pieces, textiles and many other uses.

Structure of Natural Products

Steroids.—Between 1935–40 the chemistry of the sex hormones was elucidated and shown to be related to that of sterols (cholesterol, ergosterol), bile acids (cholic acid, desoxycholic acid), and the digitalis group of heart stimulants, which had been worked out a few years before. These compounds were shown to contain a common nucleus related to cyclopentenophenanthrene.

In 1934, during the course of experiments on male urine, A. Butenandt isolated two male hormones, namely, androsterone, C₁₉H₃₀O₂, and dehydroandrosterone, C₁₉H₂₈O₂. Interest in this work was stimulated in 1935 by L. Ruzicka's synthesis of androsterone from cholesterol. The steps required two catalytic reductions and an oxidation. Later, Russell E. Marker *et al.* simplified this synthesis and announced the preparation from cholesterol of 3-chloro-5-dehydroandrosterone from which either of the naturally occurring male hormones (androsterone, dehydroandrosterone, or testosterone) were obtainable. These investigators also

synthesized estrone, a female hormone, from ergosterol. The hormone from corpus luteum, known as progesterone, is the active principle essential for pregnancy. It was isolated in crystalline form through the work of W. M. Allen, Oskar Wintersteiner and G. W. Corner.

Search for synthetic compounds with estrogenic properties led to the discovery of trans-diethylstilbestrol, $HOC_6H_4-C(C_2H_5) = C(C_2H_5)-C_6H_4OH$, so named because of the structural relationship to the hydrocarbon stilbene. It was more potent than estrone and nearly as powerful as estradiol. This result was reported by E. C. Dodds and Robert Robinson of England. Activity is lessened, according to E. E. Reid and Edith Wilson, if the phenolic hydroxyl groups in this compound are changed to ether groups.

Marijuana.-Hemp fibre had long been used for rope and clothing. Hemp seeds had been pressed for oil. The hemp plant also produces "marijuana," a term that includes any part of the plant (genus, Cannabis) or extract therefrom which brings about intoxication in man. In 1940 Roger Adams and collaborators at the University of Illinois isolated and determined the structure of the active substance in the plant.

Between the period when the female plant (Cannabis indica) is about to flower and until the seeds are mature, the hairy tops contain a sticky resin. Some resin is obtainable also from the male plant but in much smaller quantity. The resin contains the intoxicating principle of the plant. Plants grown in hot dry climates such as Chinese Turkistan produce much more resin than those grown in moist, temperate climates.

The resin of the hemp plant itself may be extracted with light petroleum. From the red oil thus obtained two compounds called cannabidiol and cannabinol were isolated. These accounted for three-fifths of the oil but explained none of its activity, since they are inert physiologically. The other two-fifths probably contain tetra- and hexahydrocannabinols which have demonstrated potency.

Chemically, it was established that cannabidiol is a substituted biphenyl. One of these phenyl groups has a pentyl radical in position 4 and phenolic hydroxyls in positions 2, 6. The other phenyl group is really tetrahydrophenyl, and it is substituted by α -methylvinyl in position 2 and methyl in position 5. The two phenolic functions explain the suffix "diol" in the name cannabidiol. This compound, as mentioned above, is inactive physiologically, but on treatment with acidic reagents it isomerizes smoothly to a new substance, tetrahydrocannabinol, which has very high marijuana activity. All that happens chemically in this change is addition of one of the phenolic hydroxyls to the methylvinyl group, thereby forming a new 6-membered oxygencontaining ring which is shared jointly by the two preexisting phenyl rings.

Cannabinol resembles tetrahydrocannabinol structurally but not physiologically. Loss of the four hydrogens brings about loss of the marijuana activity. Roger Adams demonstrated the dehydrogenation of tetrahydrocannabinol to cannabinol in laboratory experiments and suggested that reactions in the hemp plant might be similar.

Cork.-N. L. Drake and collaborators at Maryland reported during 1941 results of investigations extending knowledge of the composition of cork. Sitosterol had been identified definitely. Phellonic acid, another ingredient, had been shown to be 22-hydroxytetracosanoic acid; i.e., a 24-membered straight chain hydroxy acid wherein the hydroxy group is on the 22nd carbon from the terminal acid carbon. Paraffin hydrocarbons, C11H44 to C31H84, had been characterized also. Most of Drake's work, however, had dealt with the elucidation of the structure of friedelin, a cork substance isolated many years before and named in honour of the famous French chemist, Charles Friedel. His work proved that friedelin, C₃₀H₅₀O, is a pentacyclic unsaturated ketone. Twenty-two of the 30 carbons make up the five rings. These were thought to be staggered in the manner of phenanthrene or picene since, on drastic dehydrogenation with selenium dioxide, 1,2,8-trimethylphenanthrene and 1,8-dimethylpicene were obtained.

Quercitrin.-Prior to the advent of synthetic organic dyestuffs, the three most important vegetable dyes were indigo from the stalk and leaves of the indigo plant, alizarin from madder root, and quercitrin from oak bark. J. D. Guthrie and collaborators of the Southern Regional Research laboratory found in 1944 that quercitrin may be isolated from goldenrod leaves by extracting the dried leaves with acetone. Seven per cent of the acetone-soluble

matter proved to be pure quercitrin.

Vitamin B₁ or Thiamin.—This antineuritic vitamin was separated from its natural sources and its structure established prior to 1938 by Robert R. Williams and co-workers. For this achievement Dr. Williams was honoured as the 1938 recipient of the Willard Gibbs medal in chemistry. Rice polishings are a rich source of this vitamin, but its rarity is evident when it is realized that only about 20 grams is present per ton of the chaff. By the best process of tedious extraction, about five grams per ton is actually isolable. This vitamin, isolated in this manner as a hydrochloride, is crystalline, and analysis revealed 12 carbon atoms in the molecule. On treatment with sodium sulphite and sulphurous acid, it was split into two parts, each containing six carbon atoms. One of these units was a pyrimidine and the other a thiazole. The nitrogen atom of the thiazole was the point of attachment to the pyrimidine. Synthesis of this vitamin was the direct consequence of this analytical information.

Vitamin B₆.—Another vitamin, associated with B₁ in rice chaff is B6. Its identity was revealed in 1939. Vitamin B₆ represents that factor of the vitamin B complex which prevents or cures an acrodynialike dermatitis in young rats. Also, severe microcytic hypochromic anaemia develops in puppies when the rat antidermatitis factor is apparently the only missing component of the diet.

A group of chemists from the laboratories of Merck and Company (S. A. Harris, Karl A. Folkers, E. T. Stiller, J. C. Keresztesy and J. R. Stevens) not only established the structure of this vitamin but also synthesized it. The vitamin is 2-methyl-3-hydroxy-4,5-bis(hydroxymethyl)pyridine, CH₃ (HO) C₅HN (CH₂OH) 2. Oxidation of the CH₂OH groups to COOH groups, yielding 2-methyl-3-hydroxy-4,5pyridinedicarboxylic acid, was important evidence in solving the structure. Its synthesis was effected, starting with ethoxyacetylacetone and cyanoacetamide. R. Kuhn and co-workers in Germany announced the same structure in independent work. R. E. Eakin and R. J. Williams and also A. S. Schultz, L. Atkin and C. N. Frey showed that crystalline vitamin B₆ is a growth-promoting factor for yeast.

Vitamin K.—After 1930 investigators reported a bleeding tendency in chickens reared on artificial diets. In 1935, Henrik Dam and Fritz Schonheyder of Copenhagen reported that the deficiency factor causing the haemorrhages was a fat-soluble substance. Dam named it vitamin K (Koagulations-vitamin). Bioassay methods were developed by Dam, by H. J. Almquist in California, and by E. A. Doisy in St. Louis, Mo. Dried alfalfa leaf meal and putrefied sardine meal proved to be satisfactory sources of K. By 1937, Almquist had perfected a process for extracting the antihaemorrhagic vitamin from dried alfalfa with hexane.

The use of vitamin K in obstructive jaundice was proposed by Armand J. Quick of Milwaukee, Wis., in 1937 on theoretical grounds. Later it was established that the bleeding tendency or lack of blood clotting so often seen in patients having biliary fistulas or obstructive jaundice is due to abnormal lowering of the plasma prothrombin level and that usually the bleeding tendency can be relieved by vitamin K therapy.

In 1939 several groups of investigators attacked the chemical side of the problem. Besides Doisy, Almquist and Dam, the groups included B. Riegel and co-workers of Northwestern university and elsewhere, Erhard Fernholz of the Squibb laboratories, Richard Kuhn of Germany and R. J. Anderson of Yale. It was Doisy's group that announced the isolation of crystalline vitamin K from alfalfa extract. By chemical reactions and ultra-violet absorption spectra they established it as a derivative of naphthoquinone. Oxidation experiments showed that it was probably 2-methyl-3-phytyl-1,4-naphthoquinone and this was confirmed by synthesis. The phytyl group, which is found also in chlorophyll, is H-[CH₂CH (CH₃) CH₂CH₂]₃-CH₂C (CH₃) = CHCH₂-, or simply C₂₀H₃₈-.

Curiously enough, it was shown that the phytyl group was nonessential for the efficiency of the vitamin. Both 2-methylnaphthoquinone and 2-methyl-3-hydroxynaphthoquinone (known as "phthiocol") possess activities comparable to vitamin K.

Vitamin E.—This antisterility factor (as tested with female rats) occurs especially in the unsaponifiable portion of wheat-germ oil, corn-germ oil or lettuce oil. The phytyl group is present in its structure also. L. I. Smith and co-workers at Minnesota showed that here again the phytyl group is not a specific factor, for a considerable number of substances other than vitamin E also display vitamin E activity. This lack of specificity with vitamins E and K is striking since there are no substitutes for the other known vitamins which have been identified chemically.

Structure of Biotin.—A yeast-growth substance had been isolated by F. Koegl and named biotin. This substance which had also been named vitamin H by A. Szent-Gyoergyi, is the factor in yeast, liver and various foods which is capable of preventing the fatal symptoms resulting when animals are fed large quantities of raw egg white. The chemical identity of biotin was established during 1942, largely through the work of Vincent du Vigneaud and collaborators at Cornell University, Ithaca, N.Y., medical college. Although the role of biotin in nutrition was not fully understood, its effect in preventing death in rats fed on an egg-white diet was amazing, for as little as forty billionths of a gram per day $(0.04\nu, \text{ wherein } 1\nu = 0.001 \text{ mg.})$ was sufficient to prevent this kind of fatality.

Biotin, as extracted from liver extracts and milk concentrates by chromatographic adsorption, was a crystal-line compound, melting at 230° C., of the composition C₁₀H₁₆O₃N₂S. The structure of biotin was shown to have nine carbon atoms in a continuous chain, the first of these nine being an acid carbon (carboxyl). A sulphur atom joined atoms 6 and 9, whereas a urea residue joined atoms 7 and 8. The urea residue was recognized by alkaline hydrolysis, thereby giving rise to an analogous compound with two amine groups on atoms 7 and 8. Reaction of this diamine with phosgene regenerated biotin. Five of the nine carbons were shown to be –(CH₂) 4COOH because adipic acid, HOOC (CH₂) 4COOH was formed by destructive oxidation of biotin with nitric acid. The urea residue could not have involved atoms 1 to 5, because of

this oxidation evidence. This evidence, however, did not eliminate the possibility of attachment at 6,8 or 6,9 (rather than 7,8) but reaction of the diamine with phenanthraquinone did so. Such a reaction requires the two amine groups to be on adjacent carbon atoms, thereby substantiating the 7,8-position. Additional evidence in support of the structure of the diamine was afforded by its degradation to a thiophene derivative, namely, δ -(α -thienyl)-valeric acid, by indirect loss of two equivalents of ammonia.

Pantothenic Acid.—This vitamin, when tested on microorganisms, serves as a growth stimulator. It is made from β -alanine, NH₂CH₂CH₂COOH, and 2-hydroxy-3,3'-dimethylbutyrolactone, HOCH-C (CH₃) 2-CH₂. Roger J.

Williams of Texas was particularly active in this development. Knowledge of the structure of pantothenic acid stimulated work on the preparation of compounds of analogous structure by Jean Barnett and F. A. Robinson. They selected five other lactones, and they also substituted four other amino acids for β -alanine without being able to obtain a product in any case which would replace pantothenic acid as a growth stimulator. These workers, as well as another group of workers headed by R. Kuhn, obtained a reaction product between 2-hydroxy-3,3-dimethylbutyrolactone and taurine, which product was highly inhibitory to Streptococcus haemolyticus. This is the opposite effect to that shown by pantothenic acid. Taurine, $NH_2CH_2CH_2SO_3H$, differs from β -alanine by having a sulphonic acid group in place of a carboxylic acid group. In passing, it may be mentioned that A. A. Goldberg provided a new synthesis of taurine from 2-aminoethanol by conversion of it to 2-aminoethyl hydrogen sulphate, and reaction of the latter with hot aqueous sodium sulphite.

New Medicinals

Sulfa Drugs.—In 1936 sulfanilamide was an obscure chemical with no uses. Very little if any of it was manufactured during that year, but more than 267,000 lb. were produced in 1937, the year of its introduction to medicine. Its effect in curing bacterial infections stimulated research activity in the hope of finding still more effective drugs of this type. Sulfapyridine, sulfathiazole and sulfasuxidine were discovered during this search. The structure of sulfanilamide is $H_2N-C_6H_4-SO_2NH_2$. Sulfapyridine is $H_2N-C_6H_4-SO_2NH_2$. Sulfapyridine is $H_2N-C_6H_4-SO_2NH_2$. Sulfapyridine are similar.

Penicillin.—The beneficial effects of certain kinds of bacterial products in combating disease had long been known. Pasteur showed in 1877 that Bacillus anthracis, which causes the disease anthrax, can be repressed by other micro-organisms. The French physician Felix Hubert d'Herelle in 1917 expanded the work of a British bacteriologist, F. W. Twort, and developed means of producing an active substance by bacterial growth which he named bacteriophage, a substance of low toxicity and of considerable commercial importance, but with the drawback of being too specific for general use.

It was Alexander Fleming of London, working with cultures of certain strains of staphylococci in 1929, who discovered that a certain green mould was able to destroy the colonies of staphylococcus on an agar plate culture. The green mould was found to be a species of fungus known as *Penicillium notatum*. The filtrates from the cultures of this mould were found to have strong germicidal activity, and Fleming named the material penicillin. Fleming's findings were reinvestigated and expanded in

1940 by an Oxford group of investigators headed by E. P. Abraham, E. Chain and H. W. Florey. Shortly thereafter, Florey visited America to interest the United States government and several commercial laboratories in undertaking the commercial production of penicillin. His mission was successful, and the year 1943 witnessed the building of new plants in at least 18 interested companies, the two largest of which were Charles Pfizer and company, and Commercial Solvents corporation. By 1945 penicillin production was big business. The 1945 production was valued at about \$100,000,000,000, despite the drop in wholesale price from \$20 to 60 cents for 100,000 units.

Deep-culture technique and improved strains of moulds were the two major factors responsible for the remarkable growth of this industry. Penicillin is by no means a cureall, but the miracles it has performed are too well known for comment. At first it was necessary to store penicillin in refrigerators to avoid rapid deterioration, but Commercial Solvents corporation later placed a crystalline sodium salt of penicillin on the market capable of maintaining its high potency indefinitely at ordinary temperatures.

Late in Dec. 1945 the Committee on Medical Research, Office of Scientific Research and Development, representing 21 U.S. research organizations, and the Medical Research council, London, representing 17 British laboratories published a summary of principal findings on the structure of penicillin secured up to the end of 1944. Several antibiotics of the penicillin class had been found, all possessing the general formula, RCO-NH-(C7H9ONS) -COOH. In what is known as F-penicillin (or penicillin-I in Britain) the RCO group is 3-hexenoyl, or CH₃CH₂CH = CHCH₂CO-; in G-penicillin (or penicillin-II) it is phenylacetyl or C6H5CH2CO-; in X-penicillin (or penicillin-III). p-hydroxyphenylacetyl, or HOC₆H₄CH₂CO-; in Kpenicillin it is caprylyl, C7H15CO-. These structures explain the formation of phenylacetic acid, p-hydroxyphenylacetic acid, etc., as hydrolytic products of penicillin. K-penicillin is less desirable than the others since it is rapidly destroyed in the body. As a matter of fact, the other penicillins are largely excreted in the urine.

Acid hydrolysis of penicillin was found to yield penicillamine, characterized as D- β , β -dimethylcysteine, HSCMe₂ CH (NH₂) COOH. Unstable "penaldic acids," RCONH-CH (COOH) CHO, were formed concurrently and these decomposed readily into "penilloaldehydes," RCONHCH₂ CHO. Thus, G-penilloaldehyde is phenylacetamidoacetal-dehyde.

A thiazolidine structure (I) containing a beta lactam

configuration explains these and subsequent results and was receiving most active attention in 1945-46 as the structure for penicillin. Opening of the 4-membered lactam ring by alkaline hydrolysis gives rise to salts of a dicarboxylic acid named penicilloic acid. The penillic acids (II) are obtained by holding penicillin at 30° C. in dilute mineral acids. Treatment of the penillic acids with

COOH
$$CH S CH SH$$

$$N CH C(CH_3)_2 N CH C(CH_7)_2$$

$$RC N CHCOOH RC N CHCOOH$$

$$(III)$$

mercuric chloride is a method used to open the S-containing ring. Carbon dioxide is detached in this process and penillamines (III) are formed. Although the synthesis of penicillin was not announced, it appeared clear that the groundwork was established for an understanding of most of its chemistry.

Streptomycin.—Another antibiotic which received prominence during the latter part of the decade was streptomycin, which in contrast to penicillin is effective toward the gram negative bacteria. It seems to be particularly effective toward tularaemia and urinary infections. Not much of it was produced, and less was known concerning its structure than penicillin, but Karl Folkers and coworkers at Merck and company made progress in structural studies. They concluded that it has the general constitution of a hydroxylated base named streptidine which is attached through a glycosidic linkage to a nitrogen-containing disaccharide-like molecule. The latter contains a methylamino group and a carbonyl group. The formula of streptomycin is considered to be either $C_{21}H_{37}N_7O_{12}$ or $C_{21}H_{39}N_7O_{12}$. Streptidine is $C_8H_{18}N_6O_4$.

Dicoumarin.—In 1941 K. P. Link of the University of Wisconsin, Madison, Wis., discovered that the compound known as 3,3-methylenebis- (4-hydroxycoumarin) occurred in improperly cured clover. When such food was ted to cows they developed a bleeding ailment which was often fatal. Link's compound, familiarly known as "dicoumarin," was shown to be the causative agent of this disease. Solution of this problem led to studies on its possible therapeutic use in humans in rendering blood less coagulable so as to offset the danger of blood clots after surgery. This work was still in the clinical stage in 1946, but results on several hundred patients were gratifying.

In studies reported after 1943, Link and collaborators extended the chemistry of this type of compound. The starting point in the synthesis is methyl salicylate, or oil of wintergreen. This, on treatment with acetic anhydride, is converted into methyl acetylsalicylate, which changes into 4-hydroxycoumarin by an intramolecular condensation The best conditions found made use of an inert solvent (a mineral oil), metallic sodium as the condensing agent, and a temperature of 250° C. Reaction of 4-hydroxycoumarin with formaldehyde completes the synthesis.

Antimalarials.—Curtailment of the supply of quinine during World War II gave a tremendous impetus to a search for new antimalarials.

The chemistry of quinine itself came into the spotlight during 1944 because of its first total synthesis by R. B. Woodward and W. E. Doering working at Harvard university, Cambridge, Mass. One of the stumbling blocks in previous attempts at synthesis was the unsaturated vinyl group (CH₂=CH-) which is necessary. In 1941 this was created as 3-vinyl-4-piperidine propionic acid. This oxime was obtained from 7-hydroxyisoquinoline by steps involving methylation, hydrogenation, oxidation and nitrosation. The vinyl compound was converted to quinotoxine by condensation with ethyl quininate. This completed the synthesis, since P. Rabe had shown in 1918 that quinine could be made from quinotoxine.

This synthesis of quinine was widely heralded in the press. It must be admitted that this was due to the prominence of quinine as a drug rather than to any consideration of the chemical method of approach. Unfortunately, however, the starting point was the relatively inaccessible 7-hydroxyisoquinoline, from which it required 18 steps merely to reach quinotoxine. There seemed to be no justification for hoping that the industrial synthesis

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Atebrin was made in vast quantities during the war years, but not much plasmochin was made in view of the greater hazard attending its use. The Committee on Medical Research of the OSRD surveyed more than 16,000 other compounds as potential antimalarials. This need was real because neither quinine nor atebrin cured malaria permanently if the disease was of the Plasmodium vivax variety. One of the best of the new compounds was listed as Survey No. 7618. Although more efficient than atebrin in every way, it also failed to give permanent cures for P. vivax. This substance is 4-alkylamino-7-chloroquinoline, in which the alkyl group is the same 1-methyl-4diethylaminobutyl group found in atebrin or plasmochin. Some of the substituted 8-amino-6-methoxyquinolines, related to plasmochin but safer and more efficient, gave promise of effecting not only temporary but also permanent cures for malaria.

Insecticides and Weed Killers.-A chemist, Othmar Zeidler of Strasbourg, France, discovered in 1874 that chloral and chlorobenzene, when brought together in the presence of sulphuric acid, underwent reaction with the formation of a solid melting at 105°. The name of the solid is 2,2-bis- (p-chlorophenyl) -1,1,1-trichloroethane, nicknamed DDT. As so often happens in chemistry, a startling unsuspected use was announced for a substance discovered many years before. Sulfanilamide was such a compound, its medical properties being unsuspected till many years after its discovery in 1909. Now Zeidler's compound was achieving fame 70 years after its discovery. Its value as an insecticide was demonstrated in Switzerland in 1939. Mosquitoes, flies, bedbugs and lice were included in the large group of insects which were killed a few hours after contact with this material.

One of the modifications of benzene hexachloride, known as the gamma isomer, rivalled DDT in importance as the most efficient insecticide. This substance results from addition of chlorine to benzene.

That 2,4-dichlorophenoxyacetic acid is capable of destroying weeds without damaging most grasses (clover and creeping bent are exceptions) was a welcome modern development to home owners who had struggled against dandelions. The chemical is a plant hormone which functions by attacking plant roots.

Carbohydrates

Sucrose.—The synthesis of sucrose had attracted the ingenuity of the chemist for a long time, but two stumbling blocks had made the task extraordinarily difficult. One was the furanose ring in the fructose portion of the sucrose molecule, and the other was the fact that both the glucose and fructose units might become attached in α or β configurations, thereby pointing to several isomeric possibilities in any synthesis.

No unchallenged synthesis of sucrose had yet been achieved by purely chemical methods at the end of the decade, but an interesting synthesis by an enzymatic method was developed in 1944 by W. Z. Hassid, M. Doudoroff and H. A. Barker. These investigators placed glucose 1-(dihydrogen orthophosphate) with fructose in the presence of sucrose phosphorylase from the bacterium *Pseudomonas saccharophila*. Since sucrose was formed directly, this reaction medium brings about the essential change of the fructopyranose to the fructofuranose ring.

Carbohydrate Configuration.—Two relatively new reactions of sugars were applied frequently in 1939. One was the oxidation with lead tetraacetate. This reagent cuts the carbon-carbon bond of a glycol structure (-CHOH-

CHOH-). If the other hydroxyl groups of carbohydrates are protected against such cleavage, as by changing them to ethers or acetals, controlled scission occurs. In this way, H. O. L. Fischer prepared isopropylidene-L-glycerose and isopropylidene-D-glycerose from the 1,2,5,6-diisopropylidene derivatives of L-mannitol and D-mannitol, respectively. Similarly, Hockett severed the 4-carbon chain of methyl erythroside into 2-carbon units, and the 6-carbon chain of methyl L-fucoside into 3-carbon units.

Periodic acid cleaves the glycol portion of a carbohydrate in much the same way. In the hands of C. S. Hudson this proved to be a powerful tool for the determination of ring size and asymmetric configuration. Mannose, trehalose, levoglucosan and higher carbohydrates were also investigated in this manner.

Distillation of Sugars.—When sugars are heated they undergo caramelization and charring. Distillation in the customary sense is impossible. This is one of the reasons why experimentation with carbohydrates is difficult. Syrups which resist crystallization have been particularly troublesome to characterize, and these include malt syrup, honey, corn syrup, "hydrol" and others.

Carbohydrate mixtures may be separated by converting them to methyl ethers which are distillable. The unfortunate part of this operation, however, is that with disaccharides (sucrose, maltose, lactose) or trisaccharides (raffinose, melezitose) there is no way to regenerate the sugars from the ethers without destroying the sugar itself.

This difficulty was solved by Charles D. Hurd, K. M. Gordon and R. W. Liggett of Northwestern university in 1941. They converted the sugars to propionic esters by the action of propionic anhydride and pyridine. Such propionates were found to be distillable, even from the trisaccharides, at temperatures between 160° and 300° C. if the pressure was lower than 0.001 mm. of mercury. In this way, propionates of mono-, di- and trisaccharides could be collected in separate fractions. Mild alkaline treatment was found to remove the propionate groups and bring about regeneration of the sugar itself. Identification of the sugar in this purified state would follow the customary procedures. The fact that many of the sugar propionates were crystalline solids was helpful also in characterization.

Separation of Sugar Mixtures by Adsorption.-W. S. Reich's work in 1939 showed that p-phenylazobenzoates of glucose and fructose were separable by a preferential type of adsorption on alumina or silica. Since the layers of adsorbed material are coloured and therefore visible, the process is known as chromatographic adsorption. G. H. Coleman of Iowa extended this in 1942 to a working process for the separation of glucose from sucrose, fructose from galactose, lactose from sucrose, maltose from glucose and others. As might be expected, some other carbohydrate pairs did not give satisfactory separation. M. L. Wolfrom of Ohio State university, Columbus, O., showed that colourless acetates of sugars could be separated in much the same way. His method of locating the different carbohydrate zones was by streaking the extruded adsorbent with permanganate solution.

Other Reactions.—The reaction of glucose at 70° with alkylamines (butylamine, pentylamine, heptylamine, octadecylamine, ethylenediamine, etc.) in the presence of a little of the amine hydrochloride gives rise to glucosylalkylamine by exchange of the hemi-acetal hydroxyl of glucose for the amine group. Hydrogenation of these compounds in the presence of activated nickel opens the

oxygen bridge to produce "glucamines," HOCH₂(CHOH),-CH₂NHR, in good yields. This was reported by R. M. Hixon of Iowa State college, Ames, Ia.

An intermediate in the synthesis of riboflavin, namely, N-D-ribityl-3,4-dimethylaniline was prepared in the following way by M. Tishler et al. from D-ribonolactone. First it was converted to D-ribon-(3,4-dimethylanilide) by heating with 3,4-dimethylaniline. After acetylation of the four hydroxyl groups this anilide (RCONHAr) was changed to its imido chloride (RCCl=NAr) by treatment with phosphorus pentachloride. Hydrogenation of the imido chloride was effected with palladium catalyst (to RCH2NHAr). The final step was deacetylation by sodium methoxide.

The commercial availability of the nitroparaffins stimulated work with them in the carbohydrate field. Attachment of a nitro group to the carbohydrate skeleton was accomplished in a very ingenious manner by J. C. Sowden and H. O. L. Fischer of Toronto. Nitromethane condenses readily with an aldehyde in the presence of a base to form a nitro alcohol: RCHO + $CH_3NO_2 \rightarrow RCHOHCH_2NO_2$. Sowden and Fischer made use of the familiar Wohl degradation to produce the aldehyde in statu nascendi for this condensation. This may be visualized in a simplified presentation of their process. Let R (CHOH) CHO represent glucose. Its oxime, R(CHOH)CH=NOH, is acetylated and dehydrated by acetic anhydride to the organic cyanide, R (CHOAc) CN. Alkaline treatment breaks this down to RCHO (a pentose), but in the presence of nitromethane this compound reacts to form 1-nitro-1-desoxymannitol, R (CHOH) CH₂NO₂.

During 1943-44 there was unusual activity in the field of methylene derivatives of sugars, especially in the laboratories of W. N. Haworth (England) and C. S. Hudson (United States). Both these investigators obtained these substances by reaction of a carbohydrate at its glycol functions with formalin or trioxymethylene in the presence of either hydrochloric or sulphuric acids. The work was concerned chiefly with derivatives of these carbohydrate materials: xylitol, adonitol, dulcitol, sorbitol, mannitol and methyl saccharate.

Starch and Cellulose.—T. J. Schoch of Corn Products Refining Co. made the novel discovery in 1941 that cornstarch could be separated fairly readily into two fractions by adding butyl alcohol to a 2% starch solution. About one-fifth of the starch solids separated. This material, known as "amylose" or the "linear fraction," is crystalline and gives an intense blue coloration with iodine. The unprecipitated portion, known as "amylopectin" or the "branched fraction," gives a red coloration with iodine. A 5% solution of amylose sets to a rigid gel, whereas a 5% solution of amylopectin remains a mobile liquid. Evidence supported the belief that the amylose molecule is composed of a chain of glucopyranose units, these glucose units being attached to each other usually through the 1, 4 positions but occasionally at the 1, 6 (or 1, 2) positions.

R. L. Whistler and G. E. Hilbert of the U.S. department of agriculture reported during 1945 that the triacetates of amylose and amylopectin differ greatly in film-forming ability. Brittle films are formed from amylopectin triacetate, much like the brittle films from completely acetylated whole starch. Amylose triacetate, on the other hand, readily forms films of good tensile strength and suppleness, resembling those made of cellulose triacetate.

At the Massachusetts Institute of Technology, Cambridge, Mass., C. Purves made an ingenious study of the distribution of the acetyl groups in a technical cellulose

acetate, which averaged 2.44 out of a possible 3 acetyl groups per glucose unit. Esterification of the remaining 0.56 hydroxyl group by toluenesulphonyl chloride and analysis of the groups introduced showed ratios of 23.4: 2.16: 0.106 for positions 6,2, and 3, respectively. That on position 6 could be determined by direct reaction with sodium iodide and positions 2,3 were estimated by mathematical analysis of the rates of esterification.

The positions of the ethyl groups in the incompletelyethylated technical ethylcellulose were shown to be about the same, namely, a ratio of 15: 2.3: 0.7 for positions 6, 2, 3. This means obviously that position 3 is most acetylated or ethylated in the technical operations, and position 6 is the most difficult to attack. Positions 2 and 3 are secondary and position 6 is primary.

E. C. Yackel, C. C. Unruh and W. O. Kenyon of Eastman Kodak company announced in 1942 that cellulose is preferentially attacked at position 6 by nitrogen dioxide. The oxidation converted the primary alcohol group to a carboxyl group in yields approaching the theoretical.

Developments In Inorganic Chemistry

Separation of Rare Earths.—Joseph K. Marsh of Oxford reported in 1943 that samarium might be separated from its neighbours, gadolinium or neodymium, by treatment of the acetates with sodium amalgam. Of these three elements samarium is the only one which is readily reduced to the metallic state. In a Sm-Nd mixture it was found possible to reduce the Nd-content from 70% to 0.01% in one step. Another common rare earth mixture which is easily purified by the sodium amalgam technique is that of ytterbium, lutecium and thulium. Only ytterbium acetate in a mixture of these three acetates reacts with sodium amalgam, hence its easy separation.

Traces of europium are often associated with ytterbium, and the work of P. W. Selwood of Northwestern university provided a simple method of obtaining the europium content. If these compounds are reduced to the bivalent state, Selwood found that practically complete precipitation of europous sulphate, EuSO₄, could be obtained by coprecipitation with barium sulphate, after which the europous sulphate could be removed by washing the precipitate with hot concentrated nitric acid. In this manner pure specimens of europium may be obtained in days rather than years, which were required previously by the tedious fractional crystallizations.

Organic Silicon Compounds.-E. G. Rochow and collaborators of General Electric Co. developed a new process for making organo silicon halides which proved to be especially useful in the preparation of dimethylsilicon dichloride (CH₃) ₂SiCl₂, namely, the interaction of methyl chloride with hot pellets of an alloy of silicon and copper (10% Si). Some methylsilicon trichloride and other products are formed concurrently. Interest in this compound stems from the unusual properties of the substance it yields on reaction with water. First the dihydroxy analog is produced (CH₃) ₂Si (OH) ₂, and it then undergoes intermolecular dehydration. One may visualize the first dehydration product to be of this structure: HO-Si (CH₃) 2-O-Si(CH₃)₂-OH, and the next HO-Si(CH₃)₂-O-Si (CH₃)₂-O-Si (CH₃) 2OH, and so forth. The extent of this dehydration may be controlled somewhat, so that the products formed may vary in physical properties from light liquids to rubbery solids. This process is known as "curing." A partly cured product may be cured further by heating to 400° C., or by using such dehydrating agents as sulphuric acid or boric acid. A methyl silicone rubber, thus prepared, has several thousand ([CH3]2SiO) -units in its molecule. This may be used at temperatures much higher than ordinary rubber could withstand. Another interesting application of these "silicones" was in electrical insulation. A wire wound with glass fibre and then impregnated with a partly cured silicone resin may then be cured at 400° C. to give a product which is remarkably durable at high temperature and of high dielectric quality.

Ion Exchangers and Zeolites.—Certain materials in the soil are called zeolites. These claylike substances include the glauconites, bentonites, or hydrated aluminum double silicates. They may occur as calcium salts in the soil but such zeolites tend to bind potassium or ammonium ions when potassium or ammonium salts are added to the soil as a fertilizer. One may visualize what occurs by letting CaZ represent a calcium zeolite, whereupon reaction with potassium chloride (2KCl) produces potassium zeolite (K_2Z) and calcium chloride (CaCl₂). The calcium chloride washes off in rain water, and the valuable potassium ion is held by the insoluble zeolite.

Artificial zeolites, known as permutites, are made by melting kaolin (aluminum silicate) with quartz and soda. Their chief use has been to soften hard water. The mode of action is to replace the calcium in hard water by sodium. To do this, hard water is passed through a tank of sodium zeolite (Na₂Z). The water leaving the tank is soft. At intervals a brine solution (sodium chloride) is passed through the tank to regenerate the sodium zeolite and rinse out the undesirable calcium. The reversibility of the process and the insolubility of the parent substance is what makes it valuable.

This type of base exchange had been known for nearly a century, and its application to water purification had been practised for decades. In spite of this, intensive research on the general problem was carried on only after 1935, following the discovery of B. A. Adams and E. L. Holmes that certain synthetic resins possessed ion-exchange properties.

The new zeolites are referred to as carbonaceous zeolites and resinous zeolites. A disadvantage of the natural zeolites was their instability toward acid solutions. Both of the newer types are stable in acid solutions.

Carbonaceous zeolites are obtained by treating coal or lignite with strong reagents such as fuming sulphuric acid, or chlorosulphonic acid. S. J. Broderick and Dale Bogard of the U.S. bureau of mines reported that good carbonaceous zeolites could be made from Alabama bituminous coal by treatment with sulphur trioxide at 150° C. It may be assumed that there is sulphonation of hydrocarbon positions in the coal skeleton (i.e., ECH changes to =CSO₃H). Since these carbonaceous zeolites are sulphonates, they may function either as hydrogen zeolite or sodium zeolite. Regeneration of the hydrogen zeolites may be accomplished by treating the sodium zeolite with acid. Hydrogen zeolites, then, may remove metallic cations from solution and add only hydrogen ions into the solution in exchange. R. H. Beaton and C. C. Furnas of Yale university, New Haven, Conn., applied this method to concentrate extremely dilute copper sulphate solutions. Under idealized conditions, in a zeolite system concentrating dilute copper sulphate (1 g. in 20,000 g. of water), one pound of sulphuric acid brought about an increase in concentration equivalent to the evaporation of more than two tons of water. This method gave promise of having broad applications to recovery problems.

Resinous zeolites are of two types: (1) a phenolformaldehyde resin into which sulphonic acid groups are incorporated; (2) condensation products of aniline or aromatic amines with aldehydes, into which strong basic groups are introduced, such as quaternary ammonium hydroxides. The first of these is a cation exchanger which functions much like the carbonaceous zeolites. The second is an anion exchanger. It is obvious that as a salt-containing solution is passed through both types of resinous zeolite in turn, all dissolved salts will be removed from the water. R. J. Myers and J. W. Eastes of Resinous Products and Chemical company reported on favourable tests in water purification by this type of approach. The development was finding new uses in cases where very dilute solutions were involved.

Nuclear Chemistry and New Elements

Much information about radioactivity had been collected since the discovery of radium by Pierre and Marie Curie in 1898. The cause of radioactivity was stated by Ernest Rutherford and Frederick Soddy in 1902 to be spontaneous atomic disintegration with the attendant emission of energy in the form of rays or particles. A decade passed before Rutherford made his fundamentally important conjecture of the existence of the nucleus of the atom. Rutherford again in 1919 demonstrated that the nucleus could be disrupted artificially by bombardment with high-speed helium nuclei or "alpha particles" from natural radioactive sources. The alpha particle may be regarded as a high-speed bullet designed to pierce the nucleus of the target atom so as to knock out one or more of its constituent particles. In 1933 J. D. Cockcroft and E. T. S. Walton learned how to impart sufficient speed artificially to a hydrogen nucleus so that the latter could bring about atomic disintegrations without help from radioactive sources. Their method was to accelerate the hydrogen nucleus to a bombarding speed in a high-voltage field obtained by the use of electrical transformers. Shortly thereafter, this method was modified and greatly improved by Ernest O. Lawrence's cyclotron. In this way more than 700 atomic transformations were studied and nearly half of these produced radioactive atomic species. From 1936 to 1946 more artificial radioactive species were produced and identified than were previously known of the natural variety.

To understand the underlying principles involved in these phenomena and related ones which involve release of atomic energy, it is necessary to understand the basic features of atomic structure. Formerly, the list of chemical elements began with hydrogen as the lightest and ended with uranium as the heaviest. An atom, the smallest unit of an element, is composed of a tiny but relatively massive nucleus and a large external sphere of influence containing relatively weightless electrons. The weight of the nucleus is traceable to the positive charges and neutrons which are contained therein, the number of positive charges being invariable and different for each atom. The neutron is a neutral particle consisting of a positive charge balanced by a negative charge. It contributes, therefore, to the mass of the nucleus (because of its positive charges within). An electron may be captured by a neighbouring atom in the production of molecules or ions. These external electrons are responsible for the chemical properties of an element.

Although the number of positive charges in the nucleus of an atom cannot vary, the number of neutrons may. Two nuclei of the same element containing different numbers of neutrons are called isotopes. It is obvious from this that isotopes of the same element have differing atomic weights, but identical chemical properties since the number of positive and negative charges is not disturbed. Iso-

topes cannot be separated, therefore, by chemical means. The two isotopes of hydrogen are called hydrogen and deuterium. The nucleus of hydrogen contains simply one positive charge, whereas deuterium or "heavy hydrogen" contains one neutron in addition to the positive charge. Helium, the second element, contains a nucleus with two positive charges and two neutrons, hence an "atomic weight" of 4. Carbon, the sixth element (at. wt. 12), contains 6 positive charges and 6 neutrons. This kind of thing continues till one reaches uranium (at. wt. 238) with a nucleus holding 92 positive charges and 146 neutrons. Chemists refer to it as element number 92 because of the 92 positive charges in the nucleus. The isotope of uranium of atomic weight 235 also is No. 92, but it contains only 143 neutrons within the nucleus. Natural uranium is a mixture containing 99.3% U238, and 0.7%

U235, and a trace of a third isotope U234. To achieve the power production called for in the atomic bomb, the two isotopes of uranium had to be separated in quantity and, except for the enormous governmental subsidy of about \$2,000,000,000, such a separation would have required several decades. (See also ATOMIC BOMB; PHYSICS.) Since uranium hexafluoride, UF₆, exists as a gas above 56° C. it was the reference compound selected for most of the separation procedures. These physical methods, among others, were adopted for the separation of U235F₆ from U238F₆: electromagnetic deflection (depending on molecular mass) of a beam of ionized UF₆ molecules, diffusion through porous barriers permitting the lighter gaseous molecules to penetrate a little faster than the heavier ones, and thermal diffusion of uranium hexafluoride in a vertical annular tube kept hot at the core and cool at the outside thereby attracting the heavier isotope to the cooler surface.

Radium, as it decomposes, ejects from its nucleus a fast-moving helium ion known as an "alpha particle." If this helium missile is directed so as to collide with a beryllium atom a neutron is expelled from the beryllium nucleus at high velocity. The velocity of this stream of neutrons may be moderated by passing it through heavy water, graphite, or other materials. It is this type of slowmoving neutron that causes the disintegration of uranium 235 into two smaller atoms such as barium and krypton. The energy released in this process is 5,000,000 times that obtained from burning an equal weight of coal. As a matter of fact, uranium 235 gives off neutrons spontaneously. In a pile of pure natural uranium (chiefly 238) of sufficient size these neutrons penetrate the 238 molecule to yield a short-lived isotope of uranium (at. No. 92, at. wt. 239). Heat is generated spontaneously, and one of the neutrons in this nucleus throws out its negative charge as a "beta particle," thereby increasing the number of positive charges in the nucleus from 92 to 93. The element thus formed is named neptunium. In turn, it loses another beta particle in the course of a few days, giving rise to plutonium, element 94. This element, discovered late in 1940 by G. T. Seaborg, E. M. McMillan, A. C. Wahl and J. W. Kennedy, was first obtained pure in weighable quantities in 1942 by B. B. Cunningham and L. B. Werner. Only a couple of years later it was produced industrially at Hanford, Wash. This site was selected to utilize the cooling action of the Columbia river. The construction of the massive plant at Hanford was a triumph of co-operation between chemical engineers, chemists and physicists, because its preliminary design was under way at a time when the world's supply of plutonium

was invisible to the naked eye. As is well known, plutonium resembles uranium 235 in that its nucleus can be made to disintegrate by slow-moving neutrons.

Two new elements named americum (No. 95) and curium (No. 96) were announced on Nov. 16, 1945, by G. T. Seaborg at a meeting of the American Chemical society held at Northwestern university, Evanston, Ill. These elements were found to be among the products produced by bombardment of uranium and plutonium with very high energy (40,000,000 electron volts) helium ions in the 60-in. cyclotron of the University of California, Berkeley, Calif.

Seaborg called attention to the fact that in the periodic arrangement of the chemical elements those above actinium (No. 89), namely, Ac, Th, Pa, U, Np, Pu, 95, 96, seem to represent the beginning of an "actinide" series not unlike the rare earth series from lanthanum (No. 57) to lutecium (No. 71). This provides an explanation for the general similarity in chemical behaviour of the new elements: e.g., the valences of uranium are 3, 4, 6 with 6 the most stable; neptunium, 4, 5, 6 with 4 the most stable; plutonium, 3, 4, 5, 6 with 3 the most stable; and the prediction of very stable trivalent states for elements 95 and 96.

A. V. Hevesy's work in biochemical experiments with radioactive phosphorus was but one of many important applications which came to the front after the advent of artificial radioactivity. If red phosphorus (atomic weight 31) is treated with accelerated deuterons (the nucleus of "heavy hydrogen") from a cyclotron, then a supply of radioactive phosphorus is produced, the latter having an atomic weight of 32 and a half-life period of two weeks. When changed to a phosphate and administered in various organs of an animal its transformations in the body can be followed closely. In this way, for example, it has been shown that almost immediately after the introduction of active phosphate into the blood stream a large part of P32 is to be found in the skeleton. The role of phospholipids in fat metabolism was another of the many problems attacked by this method. (See also BIOCHEM-ISTRY; BOTANY; CHEMOTHERAPY; CHEMURGY; DYESTUFFS; FNTOMOLOGY; GENETICS; MEDICINE; PHYSICS; PLASTICS IN-DUSTRY; RAYON AND OTHER SYNTHETIC FIBRES; VITAMINS.)

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Chemistry, Institute of

See Societies and Associations.

Chemotherapy

In the brief period 1937–46, there were more significant and useful developments in drug therapy than in any preceding decade. These discoveries were of outstanding importance and effected the saving of more lives than had been taken in warfare; and the end was not in sight. While there never will be a time when there is no illness, there were fewer deaths from known diseases as scientists applied the findings of the decade and wrung from their experiments new discoveries of equal and perhaps even greater importance.

Chemotherapy is only part of drug therapy. While it had been variously defined, the word by 1946 was popularly reserved for that branch of therapy involving the use of potent chemical preparations which are effective against certain infections and other diseases, involve com-

paratively little risk for the patient and are usually given by mouth or by injection. The term was coined by Paul Ehrlich, who confined its use to chemicals active against disease-producing living agents within the body, presumably because this was his field of interest. By 1946, the term had broader significance and represented an approach to the control of disease that occupied a unique and large part of therapy. The advances made in this field from 1937 to 1946 can be summarized best by considering first the more important drugs and then the effects of these drugs on disease processes and the change in seriousness of the disease that resulted from their use.

Outstanding Chemotherapeutic Measures.-Sulfonamides.-In 1937 the possibility of controlling widespread infections such as streptococcal infections by a simple chemical substance was impressed upon the scientific world when sulfanilamide was adopted for general use. From 1935, the year in which Gerhard Domagk, a German scientist, announced his discovery that prontosil would protect mice against the dreaded streptococcal infections, until 1937, feverish research by German, French, English and U.S. investigators was undertaken to prove the safety and usefulness of prontosil, neoprontosil and sulfanilamide, all early members of what became known later as the sulfonamides or "sulfa" drugs. The results of the investigations firmly established sulfanilamide as an effective agent for the control of a variety of infectious processes.

Included in the early workers were L. Colebrook and M. Kenny of England; J. Tréfonël, F. Nitti and D. Bovet of France; and Perrin Long and E. A. Bliss of the United States. The French group first demonstrated the sulfonamides to be effective because in the body they were broken down to release free sulfanilamide. This discovery resulted in a tremendous search for new compounds; drug and pharmaceutic houses, medical schools and other centres soon were busily engaged in the synthesis of hundreds of chemical preparations, most of them being derivatives of sulfanilamide.

In 1938, sulfapyridine was introduced and was later shown to be another sulfonamide of merit. Like sulfanilamide, it possessed the common radical $-SO_2NH_2$. It was L. E. H. Whitby of England who demonstrated that sulfapyridine was more effective than sulfanilamide in the control of experimental pneumococcic infections. Later, other infections also were shown to respond even more effectively. At the same time, researchers such as E. K. Marshall, Jr., of the U.S. developed the sodium salt of sulfapyridine so that a soluble preparation could be administered by injection to those who were too ill to take the drug by mouth.

In 1939, sulfathiazole was made available. In the following year sulfaguanidine, or sulfanilylguanidine, was advanced for the treatment of bacillary dysentery. This member of the group offered a different approach as it depended for its action on its local effect in the intestine and poor solubility in the body. The other sulfonamides depended on their absorption into the body tissues so that they could come in contact with the invading and multiplying bacteria. In the same year, 1940, sulfadiazine was offered to the waiting medical profession.

Thousands of compounds were created, hundreds were tested, but only a few survived. The majority were ineffective, toxic or impossible of large-scale manufacture. In 1946 the list of generally available compounds included sulfanilamide, sulfapyridine (seldom used because of toxic properties), sulfathiazole, sulfadiazine, sulfamerazine, sulfapyrazine, sulfaguanidine and succinylsulfathiazole.

The latter two compounds were used for their effects on bacteria in the intestinal tract. All the others, with the exception of sulfanilamide, were available also in the form of soluble sodium salts.

The exact mode of action of the sulfonamide compounds was still uncertain, but experimental evidence indicated that they might interfere with certain enzyme systems necessary for the multiplication or survival of bacteria. The choice of the sulfonamide to be used in the control of an infection depended on bacteriologic diagnosis, experience gained concerning the effect of these drugs and the variety and severity of the toxic reactions that might be produced. To permit proper therapy it was necessary to know the values of the sulfonamides in the blood and body fluids, and these were determined at frequent intervals during the course of treatment. Otherwise, a drug concentration either too high or too low might be obtained.

These were the highlights of the part played by the sulfonamides in the history of chemotherapy. Regardless of the phase of the subject, there was no doubt that an army of research workers had considered it, torn it apart and, if necessary, offered a substitute in the interests of progressive drug therapy.

Antibiotics.—Another class of chemotherapeutic agents that excited the popular imagination in the period 1937–46 was the antibiotics. This term meant little until the name penicillin appeared on the horizon. In an unbelievably short time it became a household byword, and almost legendary properties were attached to it.

Like the sulfonamides, penicillin was known for a long time before its usefulness was utilized. As early as 1929 the English bacteriologist, Alexander Fleming, discovered the secretion from a mould which contains penicillin, and soon afterwards suggested its use. But it was not until 1938–40 that this suggestion was followed and Fleming's work was repeated by others and seriously studied. In 1941 was begun one of the most gigantic co-operative projects in scientific effort that the world had ever seen. In that year, H. W. Florey and N. G. Heatley, two other English researchers, visited the U.S., convinced of the value

Electronic equipment for drying penicillin. Developed to replace the freeze-drying method, this process reduced costs and speeded production of the valuable drug



-preparations for the prevention and cure of certain conditions, and as knowledge of their value increased their usefulness would be more clearly defined. An example of the progress made in this field was the discovery in 1945 and 1946 that folic acid could produce the same clinical response as liver extracts in patients suffering with pernicious anaemia. By careful experimental work it was also shown that vitamin mixtures must contain ingredients in certain proportions to be most effective. Probably one of the most important conclusions made in this period concerned the value of eating daily a good diet instead of depending on vitamin mixtures to maintain health and prevent vitamin deficiencies.

Hormones.—The medical profession had used endocrine, or hormone, preparations for many years, but it was only during later years that these products were placed on a sound basis of standardization. The effects of many preparations formerly obtainable only from animal glands were served by the development of synthetic chemicals manufactured in laboratories of drug and pharmaceutic houses. Furthermore, in the same period, the probable uses of endocrine preparations were more clearly defined, and some of the nonmedical claims were thrown aside to lessen the confusion in the field of endocrinology resulting from the use of irrational mixtures or dosages of no value.

By 1946 the useful endocrine preparations could be divided into naturally occurring and synthetic compounds and according to their use; i.e., the gland of which they were simulating the effect. Included were thyroid gland and thyroxin, available for thyroid gland deficiencies; parathormone for parathyroid gland inadequacies; adrenal cortex extract for the adrenal gland cortex deficiency; several types of insulin for the pancreas; estrogenic substances such as estrone, estriol, estradiol benzoate and diethylstilbesterol for the female sex glands known as the ovaries; progesterone and corpus luteum extract for the ovaries; androgens such as testosterone for the male sex glands; and various fractions for growth, etc., from the anterior part of the pituitary.

Other hormone preparations had become available which were not always limited in use as substitutes for missing hormones when the glands of the body became deficient in action. For example, extracts of the posterior part of the pituitary gland may be used for the control of haemorrhage following childbirth, and extracts of part of the adrenal glands may be used for the control of asthma. Of much importance was the research on the best methods of administration. Thus, the various products can be administered according to the needs of the patient, by mouth, injection, rubbing on the skin, insertion into the body cavities and even by placement in the body muscles.

Other Drugs.—Antiseptic agents for local use were of special importance during World War II, and investigators with commercial and humanitarian interests engaged in research in quest of new and more effective compounds. Many of the results obtained in this field stemmed from work begun before World War II and from researchers not working directly for agencies engaged in the prosecution of war efforts. As a result, the medical profession received quaternary ammonium compounds such as phemerol, zephiran and ceepryn, nitrofurans such as furacin and undecylinic acid compounds. Unfortunately, no compound was discovered that could be used with complete assurance that it would kill all contaminating bacteria and fungicides on contact. The development of such a product would have been of immeasurable value in the control of

athlete's foot, more correctly termed epidermophytosis, and of other conditions that plagued the soldier and industrial worker.

Two substances that excited the curiosity of the clinicians in 1945 and 1946 were benadryl and pyribenzamine preparations intended for the relief of hay fever and other allergic manifestations such as urticaria. In addition to being often dramatically effective, these compounds focused attention on an approach to allergy that had not previously been thoroughly investigated. Neither drug was a cure; both were of value only for the relief of symptoms.

Digitalis had been a standard drug for the treatment of certain heart diseases for many years. Since it was not a chemically pure substance, chemists tried to determine its ingredients, pharmacologists the effects of these ingredients and clinicians the value. Thus, purified digitalis principles such as digitoxin came into use and by 1946 had gained considerable popularity. Their purity and potency offered several advantages over the older impure digitalis preparations.

In the field of drugs relating to the induction of sleep and the relief of pain, attention was directed to new barbiturates with fewer undesirable side effects and to morphine substitutes such as meperidine or demerol. When records of German investigations were examined at the end of World War II, a substance known as amedone was brought to light and subjected to considerable trial because of its possibilities as a morphine substitute. Somewhat related were the products intended as anti-convulsants, and two useful substances for the control of epilepsy were discovered—dilantin and tridione. Intocostrin, a derivative of curare, was found to produce muscle relaxation which permitted the use of less anaesthetic during operations.

Other drugs probably belonging in the field of chemotherapy included amino acids for parenteral use and radioactive substances for the experimental investigation of blood disorders and other diseases. Perhaps such agents would be called biologic preparations by some individuals because of their origin, but their usefulness placed them in a part of therapy that included true chemotherapeutic agents. In the same way, fibrin foam, albumen, globulin and plasma, which are blood derivatives, must be considered when chemotherapy is under discussion. These derivatives were of much value during World War II and were made available in dried form, which permitted much saving in space in shipping and provided longer keeping qualities.

World War II and Chemotherapy.—The developments in research that occurred from 1937 to 1939 when the world was plunged into total war, and from then until 1946 provided unique contributions to the maintenance of the health of the fighting forces and the civilian populations. Disease was controlled on the battlefront and on the home front in an unprecedented manner. While improved hospital facilities and better training for medical personnel were of much help in therapy, the use of drugs was of great importance. Medical research helped bring the war to a conclusion more quickly, and at the same time war precipitated more research than was conducted during peacetime. If any good can be said to come of war, it would stem largely from the advances made in medicine.

Examples of the tremendous advances in treating the fighting man could be found in the records of the Allied armies. In the U.S. army of World War I, the over-all death rate from infection was 16.5 per 1,000 men per annum; in World War II, 0.6 per 1,000 men. The death rate from pneumonia during World War I was $26.0\frac{9}{70}$.

during World War II 0.6%; for meningitis it was 34% and 4% for the two wars, respectively. In World War I the complications from venereal disease rose as high as 40%; in World War II only 4%. In World War II, no man in the U.S. army died from typhus, as the army was not infested with lice; and of those who received inoculations to prevent tetanus infections, only one man died of tetanus.

Of the advances that occurred because of war research much could be said, although the full possibilities of some of the projects would not be known for years. The complete mass of research done by all countries during the war years was not known and was probably of such astronomical proportions as to be beyond comprehension for the average imagination. Since some figures were available for the medical research in the U.S., a few may be cited for emphasis. In addition to the millions of dollars spent by industry, philanthropic institutions and colleges and universities, the U.S. government provided funds for agencies such as the Food and Drug administration, National Institute of Health, the Office of Scientific Research and Development and the Committee on Medical Research, which had a close alliance with the Division of Medical Sciences of the National Research council. The work of the Committee on Medical Research was done largely through contracts with universities, medical schools, hospitals and research institutes and a few with other government agencies and commercial firms. The expense was about \$24,000,000 and paid in part for the services of 5,000 investigators who worked on a long list of subjects such as protection against influenza, pneumonia and gas gangrene; prevention and treatment of venereal disease; antimalarial compounds; treatment of wounds and shock; protection against poison gases and insecticides.

Some of the work done under the impetus of war was concerned with problems not primarily intended for therapeutic application, but nevertheless provocative of therapeutic speculation. For example, early in the course of the war, British investigators were studying protective agents against the actions of war gases such as arsenical vesicants. They found that 2-3-dimercaptopropanol, later known popularly as BAL (British anti-lewisite), has an effect on body tissues suffering from arsenical poisoning. Soon British and U.S. investigators were working together on synthesis and production problems and on pharmacology, toxicology and clinical efficacy. BAL became recognized as a treatment measure for arsenical and bismuth poisonings.

Another chemical discovered to have druglike properties was Di-isopropyl fluorophosphate (DFP), active as an anticholinesterase. It was tried at once in the treatment of myasthenia gravis, glaucoma and other conditions.

The nitrogen mustards were developed during a search for more effective vesicant war gases and were shown to have a marked effect on lymphoid tissue. Thus they were tried in the treatment of neoplasms of this tissue such as Hodgkin's disease and leucaemia, with promising results. Here was another example of therapeutic advances stemming from war-born research.

Effects on Disease.—Probably the value of chemotherapy can be appreciated best by studying the effect of drugs on suppression or control of various diseases. Even a brief study of the mortality rates of pneumonia, meningitis, streptococcal and staphylococcal infections and gas gangrene provided a dramatic and almost astounding revelation of the possibilities of modern drug therapy. At one time these were dreaded infections. In 1946, they were looked upon comparatively lightly. Even tuberculosis and

leprosy seemed to be coming under the control of chemotherapy. Epilepsy, allergy, tropical diseases, hypertension, migraine—to mention only a few—were some of the problems subject to constant attack by drugs. There was no specialty in medicine that had not benefited by the developments in chemotherapy from 1937 to 1946. These drugs did not remove the need for surgery or other recognized medical approaches to illness, but they did much to lessen the amount of illness, the severity of the illness, the complications and the number of days of illness. They helped materially to advance life expectancy in the U.S.; e.g., to over 65 years in 1946 as compared with less than 50 years in 1900.

Contributing Factors.—The value of chemotherapy and the progress with which it was credited depended on several important factors. Contributions were made by representatives of practically all recognized sciences. It was aided by a new appreciation of co-ordinated research. It was made more practical by a better approach to the laboratory and clinical appraisal of new drugs as criteria were proposed, studied, improved and adopted.

At the same time, general educational advancements provided much help. And supporting efforts, such as improved hygienic measures, the development of insecticides such as DDT, the preparation of effective rodenticides such as alphanaphthyl thiourea (ANTU) and sodium fluoroacetate (1080) contributed to the advance. Included in the educational advancements were the investigation, exposing and publicizing of questionable remedies by such bodies as the Council on Pharmacy and Chemistry of the American Medical association and the Journal of the American Medical Association. The renown and prestige of these agencies facilitated widespread dissemination of their statements. (See also Dentistry; Endocrinology; Medicine; Pneumonia; Surgery; Urology; Vitamins.)

Medicine; Pneumonia; Surgery; Urology; Vitamins.)

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Chemurgy

Chemurgy in 1937 was a word unfamiliar except to the few who had begun to explore its possibilities. By 1946 it had grown into a concept of world-wide human significance.

Chemurgy is not a separate science. It is a concept which teaches that by extending the understanding and utilization of agricultural materials the base of mankind's

wealth can be greatly broadened.

Agriculture formerly was a primitive enterprise whose products were utilized only for food, clothing and shelter. Only a few simple mechanical processes were known. Grains were cleaned and sometimes ground for food. Such natural fibres as wool, cotton and flax were woven into fabrics. Wood was sawed into lumber.

All these processes were still carried on during the decade 1937–46; they were extended and supplemented, however, by many new processes, some of which employ technologies of the highest scientific order. Agriculture's raw materials were refined and processed into many hitherto unknown ultimate uses.

Organic chemistry, plant genetics and physics may be said to have been the three basic chemurgic sciences. The arts of the agricultural, industrial and chemical engineer were basic to chemurgy, too, because they accomplished steps in production, transportation and processing which could not have been attempted without their aid.

In the pre-chemurgic era fully one-half of the agricultural raw materials produced were returned to the soil. They had no commercial markets. Only the grain of the corn or wheat could be sold. The stalks, leaves, husks and other parts of the corn plant, as well as the straw and chaff of the wheat had no markets and few uses off the farm. In some instances, such as corncobs and the straw of seed flax, the residues were a nuisance requiring expense or effort for their disposal.

So far as any human being knows, nature is creating no new iron, copper, petroleum or supplies of other minerals. Over the centuries it is inevitable that their annual consumption, accelerated as it seems to be by occasional wars, must eventually deplete these irreplaceable stores to a point where, either because of approaching exhaustion or higher costs of extraction, they will no longer be either plentiful or cheap.

In contrast, the entire annual production of plant materials may be consumed, except for seed, in any one year and entirely replaced or even increased in the next annual cycle. The principal fundamental materials for plant life are atmosphere and moisture which are converted by the mysterious powers of sunshine into solid substances. Only from 2 to 5% of the content of any plant, be it a squash or an oak tree, is actually extracted from the soil. The extracted materials are primarily nitrogen, which can be replaced from the air, potash and phosphorus, of which world supplies are fairly abundant.

The chemurgic concept of fuller utilization of plant substances therefore is based upon ever-renewable and inexhaustible sources; while mineral resources are exhaustible and irrenewable. The conservation of mineral resources is an aspect of chemurgy that became more conspicuous after the great depletions for World War II had been appraised.

Agriculture in the old sense considered itself engaged principally in the production of wheat, corn, cotton, fruits, vegetables and other specific crops. As the chemurgic idea expanded it became apparent that agriculture would increasingly regard itself as a producer of cellulose, proteins, oils, starch, sugar and other natural chemical compounds for industrial conversion.

The potential wealth in plant raw materials seemed barely to have begun to be explored by the end of the decade. It was estimated that botanists had identified 335,000 species of plants on the face of the earth by that date, but economic values had been discovered for few more

than 2,000 species. Not many more than 1,000 species were being cultivated on any extensive scale.

Relatively few of the 335,000 known species had been thoroughly examined for their chemico-economic values. One could hardly doubt that such examination would reveal that many species not cultivated would yield products of economic importance. In many instances the products eventually discovered might serve economic uses unknown to or possibly unthought of by mankind. Plant geneticists, who had nearly doubled the sugar content of the sugar beet, who had been able to breed varieties of soybeans to increase the oil content in one instance or the protein content in another, could be expected to increase the usefulness of many other species once the desirable economic characteristics were discovered. Chemurgists urged that all governments should undertake thorough studies to reveal the full chemical and economic values of national flora.

During the ten years 1937–46 new non-food uses were found for many of the standard agricultural crops. New crops were introduced into the agricultural economy. Profitable uses were discovered for some portions of the huge tonnage of agricultural residues. It was possible to state truthfully that during World War II no warship, aeroplane or cannon went out fighting from the "arsenal of democracy" without products of agriculture entering at some point into its manufacture.

A number of specific examples may serve to give a reasonably fair picture of the progress on many fronts.

Soybeans.—Soybeans (q.v.) became the most widely known chemurgic crop, since the versatility of its utilization constantly amazed those who kept up with soybean progress. A study at the end of the decade listed 200 purposes for which soybeans were used. The annual production of soybeans in the United States increased from 34,-000,000 bu. in 1936 to 200,000,000 bu. less than ten years later. The larger part of the soybean output found its way into human food and animal feed. The oil became an important ingredient of margarine, salad dressings and other food preparations. The meal became a basic protein in livestock and poultry feeds. Nevertheless, from 15 to 20% of the soybean was converted into inedible products. Chemists learned how to refine the oil by processes which separated the fractions so that parts of the oil most desirable for food could be sent to the food manufacturers while the other fractions were made more desirable for the paint or soap makers.

A dramatic war use developed from the refinement of soybean proteins. Fires, even such intense fires as gasoline fires on bombed aircraft carriers, were almost instantly extinguished by "fire-foam." This product was made from an alpha-protein of soybeans. Mixed with water as it flowed through a nozzle, it laid down a heavy foam blanket which even in a wind of hurricane force deprived fire of its necessary oxygen and quickly extinguished flames.

Extensive experimentation was conducted into the manufacture of fibre from soybean protein. Pilot plant development was achieved by the end of the decade.

Casein.—Fibre manufacture from casein, a by-product of milk, became well established. Under the trade name of Aralac, the product of a factory in Connecticut became well known. Used in blends with other fibres, the casein fibre lends softness and luster to garments. During 1946 the first factory to make paint brush bristles from casein was opened in Maryland.

Ramie.—Under the heading of new crops, ramie production in the United States began to get under way in 1946. It was estimated that from 3,000 to 5,000 ac. were growing

in Florida with smaller tracts established in Georgia, Louisiana and Texas. The erection of two processing plants, each costing about \$200,000, indicated that large industries operating in Florida were convinced that the difficult mechanical problems in the decortication and degumming of ramie had finally been minimized if not fully solved.

Sweet Pótatoes.—Florida also was the location of an \$8,000,000 plant opened early in 1946 at Clewiston by the U.S. Sugar corporation, for the manufacture of sweet potato starch. This factory was built to process sweet potatoes grown in the Florida Everglades, where varieties notable for their high yield and high starch content had been established. The annual yield of the factory was expected to be 50,000,000 lb. of starch, valued at about \$2,500,000.

Sweet potato starch resembles the tropical starches obtained from cassava and arrowroot. Cornstarch, the leading U.S. starch, is not suitable for some of the purposes for which these tropical starches had been imported in large quantities to the United States.

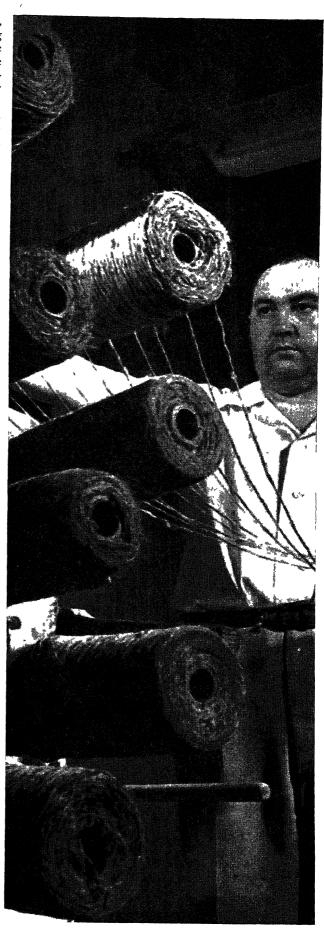
Corn.—Cornstarch, however, continued to provide one of the main non-food outlets for this most abundant American cereal. New industrial requirements steadily increased the starch demand in so many fields that no overproduction was expected for years to come. Scientists in several universities were working on assignments to increase the fundamental knowledge of starch, particularly the structure of the starch molecule. It was said that if anyone could discover the molecular structure of starch, it might even become a more important industrial material even than petroleum.

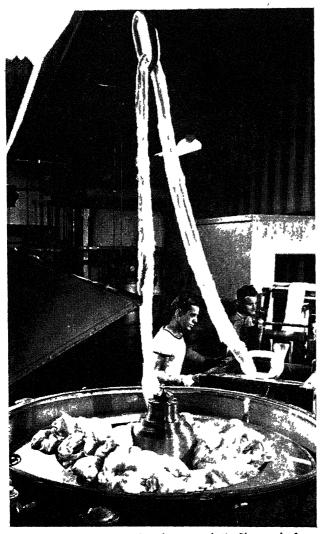
Corn (q.v.), of course, was also an important material in the manufacture of alcohol and synthetic rubber. The head of the Rubber Reserve corporation declared that the Normandy invasion could not have been conducted at so early a date had it not been for the rubber made from the alcohol which came from the corn crop.

Corncobs, hitherto an unmarketable by-product of corn, came into considerable demand to meet war needs. Large quantities of furfural were needed to refine lubricating oils and as a solvent. Produced for many years from oathulls, furfural became necessary in such large quantities that not enough oathulls were available from the breakfast food manufacturers. A new plant was constructed in which corncobs were processed to produce this important chemical. Furfural was a necessary ingredient also in the manufacture of abrasives, since it intensifies the adhesive qualities of the resins which bind the hard particles together.

Also, ground corncobs found an established market for "soft grit blasting." Used in a machine similar to a sand-blast machine, they are effective for removing grease and foreign materials from finely machined metal parts such as are found in aeroplane engines. They were also used extensively in ordnance factories for the final polishing of large guns.

Penicillin.—Corn chemurgy had an important part in the abundant production of penicillin. When this mould-produced drug was first introduced into the United States, no process for rapid multiplication of the mould had been found. Scientists at the Northern Regional Research laboratory, Peoria, Ill., discovered that production of the mould could be sharply increased if it were given a diet of steep liquor, drawn off after corn was soaked before





Process in the production of aralac, a synthetic fibre made from casein. This picture shows the machine used to recover chemicals with which the ground casein is treated

distillation, and lactose, the sugar manufactured as a byproduct of milk. The Peoria chemurgists were able to multiply the yield of penicillin first by 100-fold and eventually by 250-fold. Penicillin might thus be characterized as completely a chemurgic product.

At this point, it may be mentioned that the Northern Regional Research laboratory which did this notable work on penicillin was one of four which were created by act of congress in 1938. At that time the public demand for chemurgic research had begun to develop. Appropriations were made to build four laboratories, one in each of lour agricultural regions. The sites chosen were at Peoria, New Orleans, near Philadelphia and near San Francisco. Buildings and equipment cost about \$2,000,000 for each, and funds amounting to about \$1,000,000 each per year were made available during the decade.

Large expenditures for chemurgic research were made in industrial laboratories. The construction of the federal laboratories, directed by the United States department of agriculture, gave a tremendous impetus to research, both public and private, in the utilization of farm raw materials. Several universities established research in chemurgy. Indiana, Nebraska and other state legislatures set up special chemurgic appropriations.

Rutin.-In the field of health, the Eastern Regional

laboratory perfected the extraction of a drug called rutin. Manufactured by five or six pharmaceutical companies in 1946, rutin relieves the hypertension of blood vessels which is sometimes fatal. First extracted from flue-cured tobacco which was found to be too expensive a raw material, rutin was later made from green buckwheat leaves. Department of agriculture announcements indicated that about 50,000 ac. of buckwheat would be grown annually to supply about 10,000 lb. of rutin.

Cotton.—Being the major crop in the southern states, with surplus quantities produced regularly, cotton (q|v) was the object of much chemurgic research. One of the most hopeful approaches was the development of new varieties possessing especially desirable qualities. D. Howard Doane, on plantations in Mississippi, and George F. Wild in South Carolina pioneered in efforts to establish varieties with the characteristics most desirable for automobile tires which, next to textiles, account for the largest use of cotton during the decade.

Doane began breeding cotton for tires in 1936, and by 1941 not only had a fibre that was declared equal to that produced in Egypt but had begun marketing the output of several thousand acres. His accomplishment marked the first instance of producing cotton to meet industrial specifications. He had, at the beginning of the experiment, consulted tire manufacturers as to the nature of their requirements, and had obtained a list of the eight characteristics which they most desired. A notable discovery, made in the course of this work, was that the length of the fibre is not necessarily the controlling factor in determining its strength.

The Southern Regional Research laboratory made extensive studies of chemical treatments of cotton to improve its adaptability to varied uses. Mould-proofing treatments proved to add to the life of cotton when the fabric was exposed to moisture, as in sandbags. Flame-proofing treatments were discovered which survived frequent launderings and did not conspicuously alter the qualities of the fabrics. A new elastic cotton bandage found wide use in treatment of sprains and cuts and in surgical applications.

Fruits.—The volume of wastes in fruit production and processing became so large as to invite attention to the possibilities of finding more uses for the culls, off-size fruits, skins, seeds and other residues. One well-established result was the perfection of an apple honey or syrup from cull apples. This displaced glycerin as a moistening agent for tobacco in the factories of one of the leading cigarette manufacturers.

Cigarette Paper.—Practically no cigarette paper was manufactured in the United States prior to 1939. In September of that year Harry S. Straus, who formerly had been in the same business in France, opened a \$5,000,000 plant in western North Carolina which later more than doubled in capacity. By 1946 nearly all the paper for U.S. cigarettes was being produced domestically.

The French industry found its raw material in the discarded linen rags collected in central Europe. The first obstacle which confronted Straus in the United States was the difficulty of finding raw materials, since linen was not extensively used. After much expensive experimentation, he found that a superior grade of paper could be made from the straw of seed flax, collected after the flax crops had been threshed for the linseed so widely used in paint oils. This straw had always before been an unused waste. Straw from two widely separated areas, Minnesota and southern California, was blended to make the pulp. This formerly wasted material now not only supplied the

paper for most of America's cigarettes, but was also manulactured into paper for a portion of the United States currency.

Guar.—The search for new crops for specific purposes frequently originated with a specific need in industry. Paper manufacturers, for instance, had long desired a better material than water for hydrating the pulp as it spreads on the paper machines. The Institute of Paper Chemistry initiated a search for such a material. A satisfactory substance was eventually located in a legume called guar, native to India. From the guar seed a semimucilaginous substance was extracted which served the desired purpose in the manufacturing process and which imparted to the paper certain improved qualities.

Seed was obtained, and 25 paper companies were invited to participate in completing the experiment. A large milling company, General Mills, was brought in to process the seeds. Irrigated land in Arizona was selected, and contracts were made with farmers for producing the seed, which fortunately yields heavily. After some misfortunes substantial quantities were obtained, and the material was used in increasing quantities. A new crop, of important and profitable character for a limited area, had been established to serve a purpose for which no suitable material previously existed.

Chicken Feathers.—Chemurgic studies thus began to cover a wide range. Wherever a material was available in quantity, especially if already assembled, and if little demand for it existed, research was likely to undertake finding a profitable use.

Poultry dressing plants, for example, accumulated chicken feathers in large quantities. Usually there was a disposal problem, except for the relatively small amounts salable for cheap cushion stuffing. The feathers were removed wet, and the wet feathers deteriorated so rapidly that shipment was difficult.

A simple chemical treatment was discovered to prevent decay in shipment. This opened the way to further studies. The principal element in the composition of feathers is a protein called keratin. The Western Regional Research laboratory discovered means to reduce the keratin to a thick syrup which, after being extruded through spinnerettes and hardened in a chemical bath, emerged as a new type of protein fibre. The United States Rubber company carried on further experiments with the fibre, having manufactured some of it into cloth and into garments. The wet strength, however, was still unsatisfactory in 1946, and commercial exploitation awaited further improvements in the process.

Significance of Chemurgy.—An appraisal of the future of the chemurgic concept could not hope to be precise. Nevertheless, chemurgy by the end of the decade 1937-46 was a new idea of considerable magnitude. Conceived at first primarily as a step toward the relief of agriculture from surplus problems, it shortly became evident that by expanding industries and creating new economic activities chemurgy could contribute to the enlargement of employment. Then as the plant resources of the world began to be estimated, and their ever-renewable character contrasted with the irreplaceable nature of mineral resources, the belief began to rise that chemurgy might hope in the course of decades to become the basis for a sort of universal abundance. A solid foundation of achievement along many fronts was laid during the 1937-46 decade. Solid though it was, only the margins had been touched. (See also Botany; Chemistry; Paper and Pulp Industry; PLASTICS INDUSTRY; RAYON AND OTHER SYNTHETIC FIBRES; TEXTILE INDUSTRY.)

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Chennault, Claire Lee

), U.S. army air officer, was born Chennault (1890– Sept. 6, 1890, in Commerce, Tex. A school teacher during World War I, he was called up for service in 1917 and served in the aviation section of the signal reserve corps in the United States. After the war, he became an officer in the army air corps and commanded a pursuit squadron in Hawaii, 1923-26. He retired from the army in 1937 and in the same year accepted General Chiang Kai-shek's offer to become aviation adviser to China. In 1941, he founded the American Volunteer group of the Chinese army-a flying squadron of U.S. volunteer aviators, later known as the "Flying Tigers." Though hindered by inferior planes, the "Flying Tigers" repeatedly repulsed Japanese air attacks on the Burma road. Called back to active duty with the U.S. army air force on Apr. 16, 1942, he was promoted to brigadier general and two months later was named commander in chief of the U.S. air task force in China. Subsequently, his "Flying Tigers" were disbanded, and its members were inducted into the regular army air corps. Chennault announced (July 14, 1945), his resignation as commander of the U.S. 14th air force. Known as one of Chiang Kai-shek's most intimate advisers, Chennault defended the generalissimo against criticism by "irresponsible persons" in the U.S. and asserted that he had the "deepest admiration" for him. Chennault retired Oct. 31, 1945. He returned to China in 1946 and signed a contract in Shanghai with Chinese relief authorities to operate a relief airliner in China with U.N.R.R.A. funds.

Chernyakhovsky, Ivan Danilovich

Chernyakhovsky (1907?-1945), Russian army officer, was born in Uman in the Ukraine, the son of a railway worker. Orphaned while a child, he worked as a cowherd and later as a longshoreman in Novorossisk. By good fortune, he was able to attend a military school and there was grounded in the fundamentals of strategy that stood him in such good stead during World War II. Chernyakhovsky was a colonel when the Germans invaded Russia in June 1941. He covered himself with distinction during the fighting on the western Dvina in the summer of 1941, and a year later he was promoted to the rank of major general. In Feb. 1943 he led the soviet forces that broke through the German hedgehog defenses at Kursk. For this achievement, he was made a colonel general. By the spring of 1944, he had been promoted to the rank of army general and had been given command of the ard White Russian army. His forces, in conjunction with Gen. Ivan Bagramyan's army, cleared the Germans from White Russia. By autumn Chernyakhovsky had reached the approaches to East Prussia, and in Oct. 1944 his were the first Russian troops to cross into German territory on the eastern front. During the great offensive that started in Jan. 1945, Chernyakhovsky's armies conquered nearly all of East Prussia and he was about to complete this task when he died, Feb. 18, 1945, from a wound received in battle.

Cherries

See FRUIT.

618 Chess

The most international of all games, chess was sorely tried by the ravages of World War II. World-wide competition virtually came to a standstill in 1939, and had just begun to pick up in 1946.

Dr. Alexander Alekhine, the Franco-Russian master, ruled as world chess champion during the war years but did not live to defend his title. He died March 24, 1946, at Lisbon, Portugal, at the age of 53. No successor to his throne had been decided up to early 1947. Dr. Alekhine first came into championship prominence in 1927, when he won the world title over José R. Capablanca of Cuba. Capablanca had held the championship from 1921. Alekhine held his championship until 1935, when he was defeated by Dr. Max Euwe, the Netherlands master. Alekhine challenged Euwe in 1937, the contest being held throughout the Netherlands on a 30-game basis; Alekhine won 11 games, Euwe 6, and 13 were drawn.

The year 1937 also marked the continued reign of the United States as international team champion. For the fourth time in succession, the Hamilton-Russell cup went to the U.S. team, consisting of Reuben Fine, Israel Horowitz, Isaac I. Kashdan, F. J. Marshall and Samuel Reshevsky. Hungary finished second in the 19-team field, with Poland and Argentina tied for third.

As for other international tournaments in 1937, Alekhine won at Hastings, England, with 8 points out of a possible 9, and P. Keres of Estonia won the meeting held at Semmering and Baden, near Vienna, with 9 out of a possible 14 points.

Two international tournaments marked play in 1938. At Todz, V. Pirc of Yugoslavia placed first with 11½ points. At Noodwijk, honours went to E. Eliskases, of Germany and Austria, with 7½ points out of a possible 9. Alekhine and Sir George Thomas shared top honours in the Plymouth congress with six points each. Keres and Fine featured play in a double-round tournament, held among the eight leading masters of the game.

The United States did not compete for the international team title in 1939, leaving the way for Germany to take first place, Poland second and Estonia third. Mikhail Botwinnik regained his Russian title in 1939, while Euwe won the British Chess federation tournament. The 40th annual North American championship went to Fine, with Reshevsky second and Horowitz third. The year 1939 also marked the merging of the National Chess federation and the American Chess federation into the United States of America Chess federation.

Only Russia and the United States staged important chess tournaments during 1940. The U.S.S.R. championship, feature of the year's play, went to Keres, who among others defeated Euwe. Reshevsky won the U.S. championship.

International chess was confined principally to the soviet championship in 1941, with Botwinnik regaining his U.S.S.R. title. Gideon Stahlberg of Sweden made two important conquests in 1941. In one, he captured the accepted international tournament at Mar del Plata, Argentina. In the other, he broke the world's record for the number of boards played simultaneously and the time played. He completed 400 separate games during 36 hr. and 5 min., winning 364, losing 22 and drawing 14.

Reshevsky won the national championship in 1941, held for the first time under the auspices of the United States Chess federation.

Competitive chess was confined chiefly to the United States during 1942, 1943, 1944 and 1945. Reshevsky dominated the first part of this period, winning the U.S. title in 1942 and holding it when no national title was contested in 1943. The 1942 tournament required a play-off between Reshevsky and Kashdan, each of whom ended regular play with 12½ points. In the playoff, the 31-year-old Reshevsky won in the 11th game, 7½ to 3½.

Alekhine continued his rule as world champion, although he did not risk his title. He competed in only one major tournament in 1942, a master's test at Salzburg, Austria, which he won.

With most of their masters at home during 1942, the U.S. Chess federation sponsored five tournaments—the U.S., the national open, the national rapid transit, the national amateur and the national women's. Reshevsky extended his reign in the U.S. championship to six years by defeating Kashdan in an 11-game play-off. Herman Steiner and Abe Yanofsky of 'Winnipeg, the Canadian champion, were tied in the national open, while Fine won the rapid transit. Edward S. Jackson, Jr., of Philadelphia was crowned amateur champion, and N. May Karff of Boston regained the women's title.

With neither the world nor national championships contested, 1943 proved an "off" year in chess. Horowitz won the U.S. open and New York state titles; Dr. Ariel Mengarini of Washington, D.C., won the amateur, and Fine continued as national rapid transit champion.

Reshevsky did not defend his U.S. title in 1944, but won the national open. Arnold S. Denker of Forest Hills, N.Y., closed a seven-year reign of Reshevsky as U.S. champion. Fine retained his speed championship for the third time, and Jackson retained his amateur title. Mrs. Gisela Kahn Gresser of New York won the women's championship.

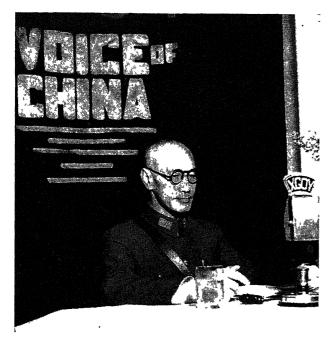
Denker successfully defended his U.S. title in 1945, while Anthony E. Santasiere of New York won the national open. Fine repeated as rapid transit champion; Paul R. Ellis of New York won the U.S. amateur; Mrs. Gresser defended her women's title, and Reshevsky won the Pan-American tournament. Russia defeated the United States, 15½ to 4½, in a radio team match.

European competition started anew in 1946 with no less than five major tournaments. Dr. S. Tartakower of Poland won the first postwar tournament at Hastings, England, while Euwe and Steiner were first in a two-division event at London. Mendel Majdorf of Poland won an international tourney at Prague, while Botwinnik, the Russian champion, won a masters' test at Groeningen, Netherlands. In the United States, Reshevsky was returned as national champion; Steiner won the national open, and Larry Friedman of Cleveland the national junior. Russia defeated Great Britain. 18 to 6, and the United States, 121/2 to 71/2, in team competition. (M. P. W.)

Chiang Kai-shek

Chiang (Chiang Chung-cheng) (1887—), Chinese statesman and generalissimo, came from a humble family in Feng-hwa, Chekiang province, and rose from poverty and hardship by his own efforts. He studied military science in the Chinese and Japanese military colleges from 1906—10. In 1910 Chiang became a loyal follower of Sun Yat-sen and in 1923 was sent to Russia to study soviet military methods and political institutions.

President of Whampoa Military academy in 1924 and virtual master of Kwangtung province in 1925, Chiang appeared upon the world scene as generalissimo of the Nationalist northern expedition in 1926. Breaking relu-



Broadcasting over the "Voice of China" on Aug. 15, 1945, Generalissimo Chiang Kai-shek announced the surrender of Japan and an end to eight years of war with that country

tions with the communists, he established the National government at Nanking in 1927. In Dec. of that year he married Mayling Soong and subsequently was converted to Methodism. After 1927 Chiang remained continuously in power: by political manoeuvring he outlasted his opponents and in the name of the central government he crushed the rebellions of 1929–36. His ten-year campaign against the communists was brought to an end by his kidnapping in the Sian incident of Dec. 1936.

After the outbreak of the war with Japan, Chiang's determination to resist Japan to the bitter end deepened the people's confidence in him, and his leadership was unchallenged for the duration. Early in 1941 Chiang declared that China had long ago cast its lot irretrievably with the democracies. Instead of resistance and reconstruction he began to enunciate victory and security as China's war aims.

A high point in the generalissimo's career came at the Cairo conference of Dec. 1943, where the principle of Chinese territorial unity including Manchuria was recognized as one of the main Allied war aims. With the coming of victory, however, complications arose. The revelation of the secret agreements made at Yalta showed that Russia not only had been promised the old tsarist rights to Manchuria but also was conceded the final separation of Outer Mongolia from China. These Allied decisions, which seemed to contradict the Cairo declaration, had to be accepted by Chiang in the Sino-soviet treaty negotiated in 1945, and subsequent developments in Manchuria—where Russia removed machinery, delayed the promised removal of its troops and armed the Chinese communists—seemed to confirm China's fears.

All this had its unavoidable repercussions on the generalissimo's attempts to carry out his political program for the unification of China. Before World War II was over he announced his intention to end the "period of tutelage" envisaged by the founder of modern China, Sun Yat-sen, under which Chiang and his party had carried on the government virtually alone. In the summer of 1945 Chiang invited the communists to participate in the

plan to set up a democratic regime and offered them important posts in an interim government, but despite prolonged negotiations for general agreement and despite the efforts of General George C. Marshall to establish unity, the negotiations repeatedly broke down, with outbreaks of civil war in widespread areas.

Thus the whole life work of Chiang in establishing the independence of China, with freedom both from foreign domination and domestic disunity, was gravely threatened. Many Chinese felt that the martyrdom of China through eight years of war had merely resulted in placing soviet Russia in the position formerly occupied by Japan. The problem of establishing internal unity with the communists was virtually inseparable from this fear of Russian encroachment because of the fact that the Chinese communists, in spite of some constructive economic reforms, were faithful followers of the Communist party line and of every turn of soviet foreign policy, including the Hitler-Stalin pact and the recognition in 1938 of "Manchoukuo" as part of Japan. Mao Tse-tung was a leading member of the Communist International until its formal dissolution in 1943. Whether the idea was justified or not, the communists were regarded by many Chinese as a fifth column serving a foreign power, a nation which already had encroached on Chinese territorial integrity and with which China still had the longest common frontier in the world. These fears strengthened the hands of nationalist and conservative elements within the Kuomintang. There were widespread protests throughout China after the revelation of the Yalta agreements, one result being that Chiang probably could not grant all the communist demands even if he wished to do so.

In view of these developments the future of China seemed obscure at the end of the decade 1937–46, but that had been the situation, basically, throughout the 22 years during which Chiang had guided the destinies of his country. He still remained the symbol and the hope of China's unity, a man who retained the respect even of many of his political opponents. His patience, his talent for negotiation and his capacity to control the extremists in his own party, while at the same time steadfastly refusing to compromise on the basic issues of China's unity and independence, might still win. (See also China.)

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Chiang Kai-shek, Madame

Mme. Chiang (Mayling Soong) (1898-), wife of General Chiang Kai-shek (q.v.), Chinese leader, was born in Shanghai, daughter of Charles Jones Soong, who as a poor boy was educated in the U.S. to be a missionary, and made good in his own country as a publisher. He was Sun Yat-sen's best friend. One of three famous sisters, Meiling was educated in the U.S. and was graduated from Wellesley college in 1927. Her career became a most remarkable one for any woman, most particularly for one of her nationality. Returning to China, she served on the China Labour commission, the first woman ever appointed to this agency. She married Chiang in 1927. When her husband was kidnapped by Chinese rebels in 1936, she flew to their Sian stronghold, induced them to release Chiang and was instrumental in persuading him to forge a united front with the Chinese communists who wanted to halt Japanese encroachments in China. A strong and vivid personality, Mme. Chiang inspired Chinese fighters, aided

thousands of orphans, resettled refugees and established hospitals. In Nov. 1942 she travelled to New York city to undergo medical treatment. She visited the White House on Feb. 17, 1943, and addressed the congress on the 18th, the first private citizen ever to do so. She asked for more help in the Pacific war, pointing out that Japan controlled more resources than Germany. In Nov. 1943 she accompanied her husband to Cairo, serving as his interpreter in the conversations there with Prime Minister Winston Churchill and President F. D. Roosevelt.

Ill health then curtailed her activities and necessitated another visit to a New York hospital in 1945, but she later declared herself cured and was again at her husband's side, working for postwar China's settlement. (Em. H.)

Chicago

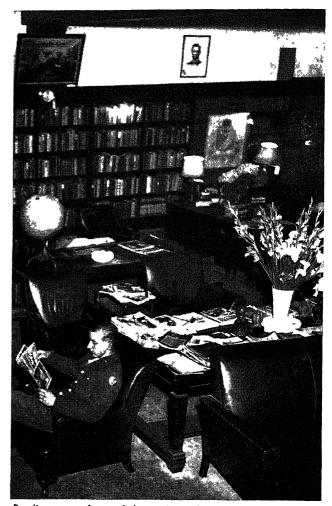
Chicago's second war decade in the 20th century was colourful but out of character. Stormy and brawling through its 1st century, the city led a relatively calm political life from 1936 to the end of World War II.

For the first time, Chicago was ruled by one dominant political organization with no effective opposition. Mayor Edward J. Kelly, originally named by the city council to fill the vacancy created by the assassination of Mayor Anton J. Cermak in 1933, was overwhelmingly re-elected in 1935, 1939 and 1943. He not only ruled the city but was actual head of the political "machine" bequeathed him by Cermak and George W. Brennan, Democratic city and state "bosses."

Notorious after World War I for organized crime and private gang wars, Chicago subsided into unwonted calm under Mayor Kelly. The repeal of prohibition and the undisputed power of the ruling political organization in the award of privileges and patronage minimized possible rewards of criminal organization and gang feuds. Except for a few flareups over illegal gaming privileges, crime in Chicago assumed a personal, sporadic aspect.

During the ten years from 1937 to the close of 1946 there was the closest liaison between the city government of Chicago and the administration at Washington. In national and state elections, the Chicago organization rolled up huge majorities that kept Illinois in the Democratic column at every presidential election. A city congressional delegation overwhelmingly Democratic was at the service of Presidents Roosevelt and Truman. In return, Chicago received grants of federal funds that lifted the city government and its subsidiary administrative units from virtual bankruptcy to affluence. Other grants-in-aid made possible public works of great value which in turn enhanced the prosperity of Chicago business men and wage earners. Federal investment and spending overshadowed private enterprise, although the latter recovered vigorously from depression.

In 1937 the city debt exceeded the limit on borrowing power imposed by the constitution of Illinois. Because of federal aid to charitable relief, public works and other functions, however, and as a result of war prosperity, the finances of the city and of the six major governmental units of the metropolitan area improved rapidly thereafter. In 1944 it was possible to introduce a new system of assessing property for taxes at 100% of value. As a result, the total gross debt of the city of Chicago (proper), the board of education, the park district, Cook county, the sanitary district and the forest preserve district decreased from \$473.463.444 in 1936 to \$231,385,760 at the close of the fiscal year 1945. The borrowing power of the six taxing



Reading room of one of the servicemen's centres at Chicago, III., which extended hospitality to 19,000,000 servicemen of the United Nations between 1941 and 1946

units increased from virtually nothing to \$963,202,832. The assessed value of property within the city limits of Chicago increased from \$1,956,928,663 to \$4,732,228,415.

Improvement of city finances and contributions from the U.S. Public Works administration made possible the revolutionary change in control of the Chicago river and Chicago's sewage required by the supreme court's limitation upon diversion of water from Lake Michigan to the drainage canal to 1500 cu.ft. per second. In addition to a control lock at the lake entrance to the river, 40 mi. of intercepting sewers were built, varying from 5 to 20 ft. in diameter, to collect 100% of domestic sewage and deliver it to new treatment plants. Two great sewage treatment plants were built with a combined capacity for purifying 1,125,000,000 gal. per day. Total costs was \$62,000,000; the Federal contribution was \$16,000,000 in cash. The sanitary district contributed \$4,000,000 cash and sold \$42,000,ooo in bonds to the government, which afterward disposed of them at a profit.

Chicago's lake front drive system north of the river was converted into a grid of high-speed boulevards and linked to the south park boulevards by a new bridge near the mouth of the river. The government contributed approximately \$50,000,000 to these projects. Total Public Works administration expenditures in Chicago and environs were approximately \$165,000,000. In the same period the WPA and other federal relief and security agencies disbursed approximately \$1,000,000,000 in the area. WPA built 3,000

mi. of subsidiary highway in the Chicago area, paved many streets and constructed several new parks.

In 1938 the first important addition to Chicago's rapid transit facilities in 30 years was begun. The traction fund composed of the city's 55% share of street car net earnings had been stuffed with frozen paper of local governments. When it thawed out, new plans for a subway were drawn. As had been the case several times before, the plans were grandiose and costly—following slavishly New York opencut, high-level models. At the suggestion of Harper Leech, a journalist, backed by J. Norman Pierce, plans for deep tubes bored cheaply through the basic clay under the city were proposed.

Frank Knox, then publisher of the Chicago Daily News, afterward secretary of the navy, induced his personal friend Harold Ickes, administrator of PWA, to back the new plan. As a result, the government contributed \$25,000,000 and the city traction fund put up \$34,000,000.

Construction began Dec. 17, 1938. The first unit—4.73 mi. from 13th street to Armitage avenue, mostly under State street—began operation in Oct. 1944. Tubes of approximately equal length were bored under Lake street, Dearborn street and Milwaukee avenue, but operating equipment was lacking for completion until long after the end of World War II. General supervision and design were the responsibility of Joshua D'Esposito, noted engineer. The subway crystallized sentiment for transit unification under public control. By a vote of 285,596 to 46,594 on June 8, 1945, the people established the Chicago Transit authority to buy and operate the street, railway, bus and elevated lines.

For 75 years a storm centre of the U.S. labour movement, Chicago escaped much of the turmoil occasioned by unionization of mass production industries by the Congress of Industrial organizations. The American Federation of Labor was too firmly entrenched to invite invasion. Only on the northern outskirts of the Chicago area at Waukegan, and at the Republic Steel plant near the southern edge of the city, were there any violent repercussions of the great labour outbreaks of 1937. On May 30, 1937, 10 persons were killed in a clash between police and strikers at the Republic Steel plant. Violent controversy followed. A coroner's jury pronounced the killings justifiable homicide. A U.S. senate committee arrived at a contrary conclusion. Sixty-one participants in the clash were dismissed with nominal fines Dec. 21, 1937.

After war industry had attained a high tempo, organization of factory workers by the C.I.O. became almost universal, but there were no major industrial disturbances until near the end of the war. In 1945, 178,000 workers were on strike in 415 plants. A strike of truckers was broken by the U.S. army, which manned the trucks.

For war purposes some 265 new manufacturing plants were constructed in Chicago. Approximately \$1,000,000,000 was contributed by the government for plant construction and expansion. The capacity of 300 plants was increased at private expense.

Among the new units was the largest bomber plant in the world and the largest aeroplane engine plant, with another of about half its capacity, also the greatest cargo plane plant. Aluminum rolling mills were added to Chicago's industries.

In the fast growing field of electronics and radio, Chicago was far advanced, and quickly took a leading position in radar equipment and in the manufacture of military precision instruments. Research into the possibilities of releasing atomic energy was initiated by scientists using the facilities of the University of Chicago. On Dec. 2,

1942, the first chain reaction for the fission of uranium atoms was produced underneath the west stand of Stagg field—man's first tapping of nuclear energy.

The cumulative total of war contracts reached \$7,828,221,000 late in 1944, most of which were executed before V-J day, in addition to several hundreds of millions of dollars worth of subsequent orders.

Approximately 475,000 men and women of Chicago and immediate environs served in the armed forces. The city was the hub of troop movements to the two coasts. Free lodging, food, entertainment and transit fares were supplied to all soldiers and sailors for the asking, and more than 19,000,000 visits to Service Men's centres were recorded. Mrs. Edward J. Kelly, wife of the mayor, was a potent organizer of these services. All war bond issues were heavily oversubscribed in the Chicago area.

Chicago began the celebration of its chartering as a city by the state of Illinois on March 4, 1937, with a series of pageants. The climax of this series was a celebration of the opening of the Outer Drive bridge Oct. 5, 1937, at which President Roosevelt delivered his "quarantine speech" denouncing dictators which led to the abortive Nine Power conference at Brussels to consider far eastern affairs.

At the close of 1946 Chicago—the scene of two highly successful world's fairs, in 1893 and 1933–34—was discussing plans for another international exposition in 1950 to commemorate the coming of peace. (L. H. L.)

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Chiefs of Staff, Combined and Joint

The "Arcadia" conference between United States and British political and military leaders which met in Washington, D.C., after the Pearl Harbor attack, resulted in the establishment in Jan. 1942 of the Joint and Combined Chiefs of Staff organizations to co-ordinate U.S. and British direction of World War II.

Composing the U.S. joint chiefs were Admiral William D. Leahy, chief of staff to the president; General George C. Marshall, chief of staff of the army; Admiral Ernest J. King, chief of naval operations; General Henry H. Arnold, commanding general, army air forces. This group also sat with the Washington representatives of the corresponding British officials. The combined committee used the title of Combined Chiefs of Staff and assumed the responsibilities

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Jan. 1942
Jan. 1945
                                          —Field Marshal Sir John Dill
—Field Marshal Sir Henry Maitland Wilson
Naval

—Admiral Sir Charles Little
—Admiral Sir Andrew Cunningham
—Admiral Sir Percy Noble
—Admiral Sir James Somerville

    June 1941
     June 1942
Dec 1942
    Nov 1944
Military
                                           —Lieut General Sir Colville Wemyss
—Lieut. General G. N. Macready
   June 1941
June 1942
    June 1941
Feb 1942
June 1943
Nov. 1944
                                           —Air Marshal A. T. Harris
—Air Marshal D. C. S. Evill
—Air Marshal Sir William Welsh
                                           -Air Marshal Douglas Colyer

    Admiral of the Fleet Sir Dudley Pound
    Admiral of the Fleet Sir Andrew Cunningham
    General Sir Alan Brooke
    Air Chief Marshal Sir Charles Portal

 21942
Oct. 1943
1942
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¹Head of Mission

of strategic direction over all theatres (except Russia), including the determination of specific operations, the allocation of resources to them, and their relative priorities.

Responsibility for executive and operational direction of the conduct of World War II in each theatre was assigned by the combined chiefs to either the U.S. chiefs or the British chiefs. The only exception was in the case of the European theatre of operations, where General Dwight D. Eisenhower dealt on combined matters directly with the combined chiefs. Thus, China and the Pacific were assigned to the U.S. chiefs, and the Mediterranean and southeast Asia to the British chiefs. In the Mediterranean and in southeast Asia, the British and the U.S. were so integrated that a multitude of details came to the combined chiefs for resolution. Examples were the exact number of divisions, landing craft, aircraft, to be allotted, and the target date for each operation. In the Pacific and in China, where practically all resources allocated by the combined chiefs were under U.S. control, these matters were resolved by the U.S. chiefs.

The U.S. chiefs were responsible directly to the president; the British chiefs to the prime minister, and the combined chiefs were responsible corporately to both.

A vital principle laid down by the combined chiefs was that of unity of command which placed responsibility and authority for an operation under one commander who was responsible to the joint or combined chiefs.

The U.S. joint chiefs organized planning and advisory committees consisting of representatives from the army and navy and, where appropriate, from other agencies. These advised the joint chiefs in matters of strategy, operational and administrative planning, psychological warfare, intelligence, transportation, assignment of materials of war, communications, meteorology, weapons, petroleum, civil affairs, etc. The joint chiefs' decisions were executed by the war and navy departments, the more smoothly and promptly since members of their staffs had functioned on the joint committees whose studies had contributed to the decisions. Important among the supporting agencies was the Office of Strategic Services, charged with psychological warfare and other quasi-military functions which lay beyond the orthodox responsibilities of the army and navy.

Most of the joint committees worked with a British counterpart, thus forming combined committees to advise the combined chiefs.

The pooling of the skills of these leaders, and the authority which they exercised in applying the entire military, industrial and technical resources of their two nations at war, were responsible in large measure for the Allies' phenomenal success in first checking the axis's overwhelming ascendency and then promptly administering total defeat in closely-knit global campaigns. (T. N.)

Chifley, Joseph Benedict

Chifley (1885—), Australian statesman, was born Sept. 22, 1885, at Bathurst, New South Wales, Australia. He left school early in his youth and worked on the Australian railroads, becoming a locomotive engineer. After joining the Australian union of locomotive engineers, he developed an interest in politics and trade unionism. In 1928, he was elected as a Labour candidate to the commonwealth house of representatives and was named minister of defense the following year. Following the Labourite defeat in the 1931 elections, Chifley lost his seat, although he served succeeding governments in technical capacities from 1935–40. Running again for the house of representa-

tives in 1940, he was returned to his seat. After John Curtin formed his Labourite government in Oct. 1941 he appointed Chifley to the post of treasurer of the commonwealth; in that capacity Chifley designed many of the wartime financial regulations. He implemented the government's control of stock exchange transactions, extended price control measures, increased taxes and sponsored measures which gave the government supervisory powers over the entire banking system. He held the additional post of minister for postwar reconstruction from 1942–45.

Chifley, who was acting premier during Curtin's illness, was elected head of the Labour party on July 12, 1945, and was sworn in as prime minister the following day (July 13). He attended the dominions conference of foreign ministers in London in April 1946, and visited Pres. Truman in Wash., D.C., the following month; he also discussed lendlease and reciprocal aid problems with state department officials. In the Australian Labour party's election of a new cabinet, Oct. 31, 1946, Chifley was retained as prime minister.

Child Guidance

See CHILD WELFARE.

Child Labour

See CHILD WELFARE.

Children in World War II

The children who survived the impacts of World War II were subjected to violent and far-reaching spiritual and cultural displacements. The effects were especially impressive and serious in view of growing social concern about better ways of feeding, protecting and guiding children. Everything learned about personality and the development of native capacity and about mental as well as physical health had made it more and more evident that any adverse effect upon children was a threat to civilization itself, to the whole future of humanity.

Statistical information regarding the effects of the war upon children was meagre. The fate of the children was so closely tied up with what was happening generally that in most areas a separate accounting was impossible, especially as much of the administration machinery was diverted to immediate efforts. For many kinds of information regarding children in most of the devastated regions, it was impossible to make reasonable estimates. Lacking statistics to measure the various kinds of damage done to children or to compare the destruction in various countries, students of the problem could at most sense the quality of the conditions resulting from the war and of the effects upon the boys and girls who were to make up and rebuild the future of each state or nation.

In every occupied country, forced evacuations and displacements of persons automatically disrupted the lives of children, their security, their physical well-being and their normal mental and emotional development. Invading armies systematically removed food, livestock, fuel and clothing in such quantities that most of the population suffered serious privations, which came especially hard upon the children.

Nutrition and Disease.—Starvation and sickness killed more children and then left the survivors more enfeebled in China than in any other invaded country. Aside from any stores they could carry off, the Japanese laid the very earth waste.

Standard diets and food requirements for children had been set by the League of Nations Technical Commission on Nutrition. According to these standards children 1 to 2 years of age require 1,000 calories per day; and the needs increase to 2,400 calories for children more than 11 years. Children's food intake got down to 500-700 calories per day for all children in Poland; to 1,000 calories in Belgium and Norway; 1,100 calories in France; and 1,500 calories in the Netherlands. In most of the other occupied countries the conditions were no better. The effects were shown in stunted growth, marked loss of weight, general debilities and lowered resistance to disease. Tuberculosis became rampant among children in many cities, especially among adolescents. Rickets and scurvy and skin diseases appeared in areas which had had no deficiency diseases for many years before the war.

In contrast, Germany's loot supplied a fairly adequate diet to its entire population during the first few years of the war, with extra rations for those doing heavy workand for children. England furnished another interesting contrast. Dietary surveys before the war showed about one-third of the population to be undernourished. During the war, food rationing, special regulation of food processing and the "enrichment" of flour, and supplementary issues of vitamins, milk and other special foods, measurably improved the general health and physique of the children. In the U.S.S.R. too, special efforts were made to meet the threat to the children brought by the invasion of the Germans in June 1941. Almost immediately orders were issued to set up nurseries and homes for children beyond the war zones. Exceptional attention was given to the nutrition of all children from infancy on. Steps were taken to guard children against deficiency diseases.

Everywhere the destruction of buildings and of entire towns and unbelievable crowding left many families homeless. Exposure, cold, the lack of soap and of the barest sanitary facilities raised the incidence of communicable diseases. And the shortage of drugs and medical supplies raised the death rate further. Diphtheria, typhoid fever and typhus reached epidemic proportions. Body parasites became common in many regions.

A good general index of the destructiveness of the war upon children was the rapid rise of infant death rates above those previously prevailing. Stillbirths and miscarriages also increased. The death rates of children of various ages, as compared with the rates for the general population, rose markedly. In Germany, the infant death rates remained nearly constant during the first three years of the war and rose slightly in 1942.

There were great variations among the occupied countries, as might be expected. At one extreme were countries like Denmark, Norway and the Netherlands, whose people the Germans invited to co-operate for the common good by graciously identifying them with their own Nordic "superrace." At the other extreme was Poland, whose people rated only enough higher than the Jews to save them from the utmost in cruelty and bestiality.

In Poland, the Germans were more ruthless, more deliberate, more calculatingly cruel and more thorough than in any other country. They exterminated 10% of the people and sought to prevent the natural increase of the population by restricting marriage to women above 25 years and men above 28 years. And they removed to German institutions all children born to younger women.

Of the 6,500,000 Jews in Europe before the war, outside the U.S.S.R., only 1,500,000 remained at the close—mostly "homeless, sick and destitute." That only about 10% of the surviving Jews in occupied countries were children indicates the intense suffering and lasting hurt. By 1946 there were practically no children between the ages of 6 and 12 years among the displaced Jews in Germany; the

number of children who survived in concentration camps was consistently small.

Where numerical data regarding children were lacking.

Where numerical data regarding children were lacking, estimates were made roughly on the assumption that about one-third of a population consisted of children. This ratio varied from country to country and as between rural and urban areas; but it was probably adequate for an overall picture. In the table on page 624 estimated figures are set in square brackets.

Education.—In accordance with their thousand-year plan for the world, the Germans undertook to demoralize the future of the occupied regions by deliberately destroying or perverting the educational and cultural institutions. The Japanese, in their earlier invasion of Chinese provinces, had made use of opium for the demoralization of their future vassals.

Except in Denmark, where numbers of schools were taken over and several teachers replaced by Germans, school buildings in large proportions were converted into barracks, administrative offices, warehouses and sometimes into hospitals; and in many cases they were deliberately destroyed.

Through the schools, play organizations and general propaganda, the Germans tried to undermine democratic sentiments and principles, to destroy national pride and to make the "ideology" of young people and children conform to nazi doctrine and attitudes. German was substituted for the native languages. Textbooks were "corrected" or replaced by others. The content of history teaching was standardized. All references to World War I were eliminated. Secondary schools suffered particularly, as they were possible sources of leadership. Some were converted into training schools for technicians. Where they were kept for the education of a selected few, the curriculum emphasized the classics. Children of all ages were formed into special groups outside school hours for cultivating of "correct" understanding, "correct" attitudes and useful skills in marching, taking orders, athletic performance, and so on-all of course in line with the nazi philosophy. In many cases school children as well as teachers were forced to contribute hours of labour regularly.

In all countries teachers and professors were removed to make way for "loyal" or German replacements. Many were arrested, sent to concentration camps or placed at manual labour; and in a few cases they were executed as dangerous characters. The object was to weaken educational resources generally and to eliminate unsound influences upon the minds of children.

Poland was explicitly marked in the official doctrine "to be made into an intellectual desert." All the universities and colleges were liquidated; other cultural institutions, laboratories, scientific collections, libraries were pillaged and laid waste. Secondary schools were immediately eliminated, except for trade schools; and these were adapted to the needs of the Germans. At the end of the war, virtually all the children in Poland under 16 years of age were without elementary schooling. Very few of the older adolescents and young adults were equipped to carry forward the needed educational and cultural efforts. Half the surviving teachers were completely lost to the profession.

The number of schools that continued to operate in an occupied country was no measure of the educational effectiveness remaining. In many cases schools had to be closed for lack of fuel. Absenteeism was generally great because so many children had no suitable clothing; footwear was especially lacking. But most of the children who

were children

Extensive starvation

Epidemics

Children Affected by the Disruption of Families

Physical Deterioration of Children

Rise in Mortality Rates ant mortal General Infant mortal

Belgium Population 1939: 8 400,000 Children: [2,800,000]

200,000 persons sent to internment camps =[60,000] Of the older girls and boys, 80% had lost 9-10 lb. in children

abandoned Total about [230,000] children directly affected "Half the families were affected by displacements"

children
600,000 men and women deported to Germany=
[150,000] children abandoned
30,000 sent to concentration camps;
25,000 civilians killed = [20,000] children orphaned or abandoned

weight
In 1943 of 40-50,000 school children examined, 40% were below standard, 30% were losing weight
Skin diseases were common in small children
Impetigo, carbuncles and conjunctivits prevalent
Tuberculosis death rate rose 57% in 3 yr.; 87% of cases

Starved children daily removed from the streets of Shanghai

1938-41 72.5-84.2

China

Out of 200,000,000 under Japanese occupation, 40,000,000 displaced persons = [13,000,000] chil-Population: 495,000,000 Children: [165,000,000] dren

aren 1938: at least 1,000,000 children in need of aid in the coastal provinces Increased to 2,000,000

increased to 2,000,000 Extensive separation of children from families
About 65,000 in various orphanages
Orphans and waifs est. at 2,000,000 by 1945; many of them wandering over country begging for food or stealing it, sleeping anywhere

Czechoslovakia Population: 15,250,000 Children: [5,080,000]

Nearly 10% of pop. displaced, including 60,000 executed and 900,000 persons, half under 25 yr. of age removed for forced labour =[300,000] children 200,000 sent to concentration camps, affecting [60,000 to 70,000] children

Entire communities were removed to German labour camps
Many children and young people left their families to

join the underground
Thousands escaped to foreign countries

Denmark

Population: 3,800,000 Children. [1,280,000]

5,000 families in May 1941 5,000 families escaped to Sweden, with children
Children of Jewish parents who were removed to Germany were taken in freight trains to detention camps

France Population: 38,000,000 Children: [12,700,000]

4,000,000 displaced persons, including 850,000 war

prisoners, 1,000,000 forced evacuations =[300,000] children; 900,000 deported for work in Germany, affecting [200,000] children; 250,000 refugees to colonies =[50,000] children

Nearly all the children in Paris given the skin test for 66.0-73.0 tuberculosis showed positive reaction
By 1942 the death rate for tuberculosis increased 51%
Impetigo, boils, carbuncles and conjunctivitis widespread;

scables

Greece Population: 7,500,000 Children: [2,500,000]

10% of the pop. starved to death, including probably [250,000] children | Malaria reappeared | Impetigo, carbuncles and conjunctivitis became widespread | Tuberculosis rate mounted rapidly

sabotage, etc.
Thousands of families were dispersed by executions and

imprisonments 19 towns were completely destroyed by bombing; 1,000 communities were destroyed by Bulgarians and Germans and 150,000 refugees fled =[50,000] children

Increased to 750 per

Netherlands Population 9,090,000 Children [3,000,000]

150,000 died in the invasion

150,000 died in the invasion
850,000 left their homes for various reasons—more than
9% = [250,000] children
300,000 houses destroyed—probably that number of
children unsheltered
Parents of 10,000 children were sent to concentration
camps, leaving children unattached
Entire families with children deported to forced labour in
Germany

Germany

In 1941, half the children were underweight Malaria reappeared
Meningitis, polyomyelitis, scarlet fever and influenza were

widespread
Rickets increased rapidly, unknown after World War I

Half the newborn children were underweight Diphtheria became epidemic; death rate up 180% Tuberculosis death rate went up 47%

36.5-43.2 from 1939-41 up 17% 5-14 yr., up 27% 15-24 yr., up 43%

Norway Population: 3,000,000 Children: [1,000,000]

Thousands of families were forced to leave homes to make way for airfield, military zones, etc.
Entire villages were burned down in reprisals
Property confiscated
Tens of thousands of families fled to escape gestapo; many young people and children fought underground

Poland Population: 34,800,000 Children: [11,600,000]

10% of pop. exterminated in war operations, through slaughter in concentration camps and gas chambers 25% of pop. uprooted and left destitute—8,600,000 persons = (2,800,000) children 2,000,000 deported to slave labour in Germany 286 villages destroyed 300,000 persons in resistance home army At close of war, 200,000 persons in concentration camps; 1,200,000 orphans

1,200,000 orphans

Typhoid, dysentery, infant diarrhoea prevalent
Typhus epidemic
Tuberculosis rate increased 113% among non-Jewish;
435% among Jewish pop.
In Warsaw, 1943, 300 deaths per month from tubercu-

Notifiable diseases increased 70% in 1942

1938-1940 100–260 Warsaw, increased

1939-40 increased 45%

Union of Soviet Union of Soviet Socialist Republics Population 1939: 170,500,000 Children: (1939 census) More than [60,000,000] under 14

40,000,000 persons evacuated from invaded areas = [14,000,000] children
200,000 children evacuated from Leningrad, at end of 1945, only 25,000 could be returned to own homes
At least 1,000,000 complete orphans; 3,000,000 other children separated from families
1,710 towns and 70,000 villages partially or completely destroyed, leaving 25,000,000 persons without shelter act least 8,500,000-9,000,000 children
In R.S.F.R. (Russia proper) alone by end of 1944, 17,000 children's homes were caring for 1,200,000 youngsters

More than 1,000,000 children in invaded area suffered from rickets and other nutritional diseases 12,000,000 children were deprived of all woolen cloth-

12,000,000 children were deprived of all woolen clothing by the Germans
All institutions for prevention and treatment of disease were destroyed in the occupation in infants' homes, the death rates were "staggering"—as high as 100% in individual instances; and all the surviving children suffered from mainutrition Every one of the 1,002 children's medical consultation centres in the Ukraine was destroyed

did attend were too hungry or exhausted to profit from the best efforts the teachers might make.

Attempts to transform the thought of the conquered peoples were generally not successful, in spite of the great destruction they caused. To supplement these methods, parties of children were sent from conquered regions to Germany on holiday tours, and in some cases for longer periods of schooling, that they might acquire the "Aryan" spirit.

Teachers in all countries resisted attempts to convert them and to make them put pressure on the children. In the Netherlands, Norway, Belgium and Czechoslovakia, the resistance was sufficient to produce considerable defiance on the part of the children and of their parents. When schools were closed or when teachers were removed, many families managed to continue their preferred kind of instruction secretly. The University of Leyden, in the Netherlands, was closed when a professor protested the dismissal of a Jewish professor. All the universities were closed in Czechoslovakia. In Greece, the university buildings at Salonika were turned into a German hospital, while those of the Athens technical university were turned into an Italian hospital. The University of Athens was closed when the students continued to resist the new order. In many countries, even younger students worked in the underground; others fled in groups to continue their studies elsewhere or to join the Allies.

In France, the Vichy government aided the German plan by encouraging church schools as against the secular schools; by making the secondary schools classical in form and restricting them to middle-class children; and by weakening the primary schools. Three of the universities were closed and the goal seemed to be to "bring France back to the middle ages." But in Norway, where resistance to nazification was general, it was felt that the occupation "set education back two generations."

In the soviet invasion, the Germans wrecked and defiled school buildings, scattered the teachers, destroyed books. In Stalingrad, 95 schools were burned down as well as all kindergartens, libraries, the Physical Culture institute and the Palace of Young Pioneers. When the soviets came back, schools were quickly reopened; students brought back books, maps and other equipment, even furniture, which they had buried when the Germans came.

The Japanese invasion of China brought similar destruction of universities and schools, wholesale arrest or execution of teachers, the replacement of the curricula and compulsory teaching of Japanese. Young people were organized for special training and forced service. A distinctive development in China was the great migrations of students in groups and individually out of occupied areas, and the transportation of school and university materials into Free China, where more students attended schools and colleges than in all of China before the war. Teaching was carried on, sometimes underground, with help from the local population. Students were organized in small groups for ready escape; the "mobile" schools moved away when the Japanese approached, and moved back when they left.

Special Provisions for Care and Protection.—Before World War II, the welfare of children was receiving more and more attention in all countries. Special efforts were made to meet the war emergency and to counteract, so far as possible, the immediate impact of war conditions upon children. The extent and the effectiveness of such efforts were largely determined by economic and technical resources as well as by the violence or magnitude of axis interference with a people's life. And the char-

acter of the provision for children was also influenced in each country by the cultural unity and the traditional patterns of community and family life. An indication of the common goals and of some ways of achieving them under special conditions may be gained from an account of a few distinctive undertakings.

The outstanding project for anticipating special wartime conditions was England's evacuation project for removing children from congested population centres, to protect them from air raids. Plans for evacuation were completed in the summer of 1938. The first evacuation, starting two days before the outbreak of war in Sept. 1939, moved 1,381,000 persons in four days-about half the number eligible. Various difficulties at the reception centres were smoothed out in about three weeks. The most surprising and disconcerting of the difficulties turned out to be social or cultural rather than administrative or mechanical. Neither hosts nor guests were quite prepared to deal with mothers and children of radically different habits and attitudes. Emotional tensions among the children manifested themselves frequently in ways that aggravated the situation. A different kind of difficulty arose from the fact that as air raids began, medical examinations became impossible for all the children and many brought with them to the reception centres scabies, impetigo and pediculosis, which rapidly spread to others. As no air raids took place in the following months, about 90% of the mothers with their small children and about half the unaccompanied children returned to their homes by the following January. In June 1940 a continuous removal of weekly parties was begun. In August, when bombing attacks were started, the process was accelerated until groups were leaving daily. As the raids decreased, many mothers and children drifted back to the cities; and by the end of 1942, only some 222,000 children remained in all the reception centres.

The evacuation of the younger children from the day nurseries and nursery schools was considered an unqualified success. The experience as a whole, however, pointed to an acute shortage of social workers and to need for their better training as well as to a great need for psychiatric care for children. Steps were immediately

Scavenging in a U.S. army mess hall during 1945, three children of Berlin tried to find scraps to supplement their own thin rations





The Pestalozzi village for homeless European orphans at Trogen, Switzerland. This photo shows a model of the community designed to shelter several hundred children, to restore them to health and each them a trade

taken to meet these needs and to improve the schools and the medical care and the billeting in the reception centres. In spite of crowding, material shortages and the interruptions of routine, the children of England generally benefited both in health and in their education. Nearly all the children who had been evacuated were decidedly improved in physique and general health as well as in their bearing and self-assurance.

Provisions were made for the health care and continuous education of the many British children who remained in the cities for various reasons or who continuously drifted back from the reception centres to their homes. In bombed-out areas and in certain industrial areas the shelters came to be almost continuously occupied by families and by schools. Throughout England, special measures for the nutrition of mothers and children included milk for pregnant and nursing mothers and for children to the age of five years (at a low cost or free—where indicated) and a vitamin issue. Milk was also provided for 4,000,000 school children; and meals in schools for 1,000,000. Repeated surveys showed that the children's health was consistently better than it had been before the war and that the condition of their teeth had improved.

In the soviet union, after the German attack in June 1941, tens of thousands of children were moved from the war zones to numerous homes opened for them in the rear. Children were evacuated from besieged cities. Special arrangements were made to care for orphaned children or those who had become separated from their families; at the end of the war 250,000 had been adopted. Some difficulties resulted from the return of parents presumed dead, but adoptions or foster homes were still preferred to institutional care although homes were provided for all children in need.

For children who could not be evacuated, shelters were provided for educational and other activities under supervision, in addition to health centres or hospitals. Special attention was given to the nutrition and health of all the children. Although the Germans systematically started epidemics in the occupied regions, the physicians and sanitarians kept these diseases from spreading to the rear.

Soviet children generally received unusual attention because the common thinking literally and seriously looked to children as the nation's future. Individual adults of all classes seemed to feel a personal concern about each individual child. "The best of everything goes to the children" was a common sentiment.

With children's welfare accepted as a national concern in the U.S.S.R., the emphasis naturally shifted to babies and mothers. Mother and child consultation centres were established in all regions; by the middle of 1944, there were 3,499 such centres in cities and 2,304 in the country. The most elaborate developments were in the establishment of day-care centres and nursery schools. The soviets apparently went furthest in taking infants-as young as six months-where mothers preferred to work rather than remain at home. The question of "need to work" never arose, since the mother who cared for her child received her regular pay just as her child received regular medical or other special services. There were nearly 300,000 yearround nurseries toward the end of the war. In the summer of 1944, 4,500,000 farm children were cared for; special seasonal nurseries were set up to follow the harvests. There were few kindergartens before the war; by 1941 there were 14,335. At the end of 1944, nearly 18,000 were caring for about 2,000,000 children. Many of these were moved to the country during the summer months for full-time care, while their mothers were working. In addition, summer camps looked after 300,000 children in 1944. Soviet children on the whole came through with a good health record and in good physical condition; and even those who had become separated from their families showed a high degree of self-confidence and security.

In China, children constitute a larger portion of the total population than in European countries; and the war was relatively more destructive of human potentials. The traditional family pattern still common in vast areas was unable to manage the displacements with the accompanying destruction of the very sources of subsistence. Mil-

lions of children separated from their families and customary routines of life were gathered in camps that offered hardly more than the barest physical existence and a minimum of educational supervision. In many cities nurseries were established and also centres for the feeding and medical care of children. The resources were pitiably inadequate. And besides the large numbers who perished from disease and starvation, there remained uncounted children wandering about the country-side, begging for food, sleeping anywhere and helping themselves however they could.

In the United States, nearly a quarter of the nation's families were displaced during the preparations and actual participation in the war. The children bore the brunt of the uprooting of homes as well as of war's direct impact upon families. Concern for children was further heightened when the draft revealed unsatisfactory health conditions among young people generally.

Nursery schools, day nurseries or day-care centres were rapidly increased in numbers to care for young children whose mothers were drawn into various kinds of urgently needed work. By the end of the war there were 2,000 such centres set up with funds furnished by the federal government besides many hundreds of others under private auspices or set up in connection with war industries.

The age at which children were accepted in these centres went steadily down as mothers found it more advantageous to work at some job than to spend all their time at home. The hours were lengthened from the traditional "school hours" to fit the working hours of the mothers, and as more women worked in shifts, many centres adopted 24-hour schedules. The program was extended to year-round operation. Some also arranged to have hot, cooked food ready for the mother to take home to the family when she called to take her child or children home. These child-caring centres developed a new type of "teacher," trained in understanding young children and concerned with the well-being of the entire child rather than with specific learnings. They also developed more systematic co-operation with medical and health agencies and with social and psychiatric workers.

After the U.S. entered the war officially, the largest single contribution to the morale of married soldiers and sailors was the constant assurance that their wives and children were being well looked after. The "E.M.I.C." project (emergency maternity and infant care) for the wives of men in the armed service was set up under the administration of the children's bureau in April 1943. It included prenatal care, delivery (in hospitals wherever possible) and the health care of infants and children. Up to Nov. 1946, 1,000,000 births had come under this service.

Health care for U.S. children of school age was widely but rather unevenly extended throughout the country. Special efforts were made to stimulate and co-ordinate local, state and national activities on behalf of children, made necessary by the fact that so many were diverted from school by the labour shortage and the chance to earn money. Nearly one-third of the boys and girls between the ages of 14 and 17 were at full-time work during the school term; in the summer of 1944, 5,000,000 of this age group (more than half) were at work. Thousands of younger children also had to be protected against violations of labour standards for young workers.

In every state the legislature took action to enlarge and intensify school programs for physical training and health education. Extension of health services showed results in a steady lowering of infant death rates and in better physical condition of children generally. The various health and school activities emphasized the great need in many areas to bring the facilities up to standards long exceeded in many states and cities.

Social Consequences.—Destruction of the material setting disrupted familiar patterns of daily life and disarranged institutions and conventions that give children signs and directions for their guidance. In all countries it became necessary to improvise special programs to engage the children and regulate them and also supplementary activities to enlist their enthusiasms and efforts for the common goals. The specific content of these programs varied among nations and among different parts of each population. In most countries, however, the schools and the various children's organizations operating out of school were used systematically both to develop special war services and to get children to take part in civilian or community services. Incidentally, taking part in these "extra" activities almost everywhere improved not only the bearing and spirits of the children, but their "regular" school work, in spite of many interruptions.

For vast numbers of children and adults, living conditions in occupied areas deteriorated to a level that made getting the barest necessities or keeping warm their chief concern. It had become so difficult to keep clean that past a certain point most people did not try; the results in lowered self-respect were more serious than the results in disease or infestation with fleas or lice. Preoccupation with mere subsistence destroyed ordinary conventional restraints, consideration for others and for the requirements of the community.

Being dominated by arrogant and ruthless intruders commonly depressed adults; and children reflected the mood in loss of enthusiasm and initiative. Physicians were aware that they had something more subtle to deal with than carbuncles or indigestion or anaemia. They discovered that their efforts were often thwarted by the sheer indifference of their patients.

Forced evacuations and violent displacement were cruelly devastating to the spirits of the children. Some measure of this was found in studies of children who were displaced in the British evacuation. There the separation of the child from the family was planned and orderly, and living conditions in the reception areas were on the whole favourable. Yet even for younger children, who went with their nurses or teachers, the sudden plunge into a new world of strange persons, strange ways, strange food produced marked emotional strains. The anxieties were revealed by bed-wetting, stealing, crying, indigestion, loss of appetite, nosebleed and aggressive or sulky behaviour. Indeed, it was found that the air raids seemed to cause less and the evacuations more emotional disturbance than had been anticipated. Children in occupied countries were subjected to even more painful displacements; they were confronted by cruel and unfriendly strangers, by harrowing atrocities. Hundreds of thousands were brutally treated, overworked and abused.

Children generally shared the high morale of their elders, as they shared in bearing privations and added difficulties or in efforts to combat the enemy. But incidentally, millions of children in all countries became habituated to theft, lying, deception, secretiveness, evasion. Such modes of dealing with others were often necessary in the struggle to survive or to help a family survive. And they acquired special merit when they served to harass or destroy the enemy. Many boys and girls became adept at various forms of sabotage, ingenious in sneaking through

military lines, skilful in obtaining useful information and in passing on misinformation where it would do the most harm.

The common moralities broke down generally among young people and children who became too far separated from their families or community activities. From the long-time point of view, the most serious consequences were likely to come from the fact that millions of children in Europe and Asia were completely detached from all guidance, all positive disciplines, all standards and ideals of social meanings or human values. When the war ended, millions were already out of hand. Sexual promiscuity became commonplace: quite generally the venereal diseases spread to lower and lower age levels, even in countries that never saw an "enemy."

Delinquency.—The rise of juvenile delinquency in countries at war was attributed to the disruption of homes, the absence of fathers from home, the deterioration of school and other regulatory agencies, removal of children from familiar suroundings and associates. In England, specific conditions related to the air raids were apparently important factors in the fluctuation of the delinquency rates. The conditions most frequently associated with offenses were the black-out, the dislocation of home life, wartime restlessness, disruption of school life, large earnings of youth fully employed, and deficiency in corrective and supervisory facilities.

Offenses by juveniles under 17 years of age increased sharply the first two years of the war, declined somewhat in 1942 and then increased again. For England and Wales, the summary figures from the magistrates' court were as follows:

Juveniles Found Guilty in Magistrates' Courts¹
1938 1939 1940 1941 1942 1943 1944 1945
55,270 52,814 65,771 72,105 66,179 67,659 67,636 72,940

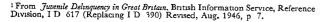
The peak of delinquency, in 1940-41, coincided with the period of maximum air raids, with mass evacuation and absence of adults from home.

During the first year of the war in Europe, juvenile delinquency increased generally. In Belgium, *e.g.*, the number of juveniles brought into court increased from 14,550 in 1939 to 19,329 during the first year of German occupation.

Delinquency and crime increased generally. Children who went astray literally returned to plague communities that considered themselves innocent victims. Some observers reported a lack of delinquency in the U.S.S.R; if the soviet union was indeed exceptional in this regard, the reason may perhaps have been partly caused by the special effort to make each child feel that he was needed and had important work to do.

For a long time to come, wayward boys and girls would constitute a difficult problem in re-education, re-socialization, not to say re-humanizing. The breakdown of schooling added a special difficulty to the organization of orderly living, since gross ignorance in large masses had always been a fertile field for superstition, mysticism and unreason. But in the Netherlands, centres were set up for the rehabilitation and vocational training of adolescents.

Vagrant and homeless children were in many cases observed to develop their own solidarity and their own patterns of mutual aid and co-operation. Such spontaneous groupings might maintain social relationships and ideals at the level of adolescent "gangs," but they did





Ill-clothed and scantily fed, these children in the old quarter of Bratislava, Czechoslovakia, were typical of thousands of European children during the disorganization following World War II

indicate that children generally have native capacities for civic adjustment and for becoming loyal and dependable members of a community. It abandoned children developed serious antisocial or moral defects from being shut out of the larger brotherhood, from the fears and suspicions dominating their attitudes, they were still inalicnable elements of the raw material out of which mankind had to build its future.

The Family.—The social importance of the family was more dramatically emphasized in the deteriorations of personality than in the material privations suffered by children uprooted by the war. The affection and security that lead to self-assurance combined with responsibility and regard for others that society demands of all can come only from the family—that is itself accepted by the community.

The changes in the structure of the family as well as in the social, economic and cultural setting of modern life made it increasingly difficult for families to do by themselves what the community expected of parents in caring for and guiding children. World War II stressed the need for more special services and facilities to further the health, education and well-being of children which only the community can furnish.

In contrast to the teenagers, more and more excluded from the life of the adult community, the young people in all countries at war were keyed up to a high pitch of enthusiasm and self-assurance by the chance to take part in important activities. The end of the war threatened to deflate their spirits unless special efforts were made to enlist their interest and devotion through education and occupational opportunities to become responsible and self-respecting men and women in their communities.

Women carried a great share in the war on all levels of service and in all countries. This experience sharpened the issues as to woman's place in modern society, which were taking form for several generations. No traditional formula could be accepted as a standard. Various patterns

of family life would undoubtedly develop, but in all cases it would become necessary to reconcile the need of children for what only home and mother could give with the needs of women as persons and as participants in the life of their times. It became increasingly important for communities to help homes with new technical and professional services and to find constructive adjustments among the several roles that women have to play. (See also CHILD WELFARE; EDUCATION).

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Children's Books

The ten years 1937-46 produced a formidable array of children's books, but the high calibre of many of the titles was evident. The Newbery award, made annually for the most distinguished book of the previous year, and the Caldecott award, also given annually to the illustrator of the most distinguished picture book of the previous year, well represented the tastes and interests of the child. In 1937 the book awarded the Newbery medal was Ruth Sawyer's Roller Skates; Kate Seredy and her book The White Stag won it in 1938; Thimble Summer by Elizabeth Enright was awarded it in 1939; Daniel Boone by James Daugherty in 1940; Call It Courage by Armstrong Sperry in 1941; The Matchlock Gun by Walter Edmonds in 1942; Adam of the Road by Elizabeth Gray in 1943; Johnny Tremain by Esther Forbes in 1944; Rabbit Hill by Robert Lawson in 1945 and in 1946 Lois Lenski and her Strawberry Girl received the award. The Caldecott medal was awarded for the first time in 1938 and went to Dorothy Lathrop for her illustrations in Animals of the Bible; to Thomas Handforth for Mei Li (1939); to Ingri and Edgar D'Aulaire for their Abraham Lincoln (1940); to Robert Lawson for They Were Strong and Good (1941); to Robert McCloskey for his Make Way for Ducklings (1942); to Virginia Burton for The Little House (1943), to Louis Slobodkin for his illustrations in Many Moons by James Thurber (1944); to Elizabeth Jones for her drawings in Rachel Field's A Prayer for a Child (1945) and in 1946 to Maud and Miska Petersham for The Rooster Crows, a Book of American Rhymes and Jingles.

Rise to a Peak.—Two outstanding picture books by distinguished artists characterized 1937. Conrad Buff, in his illustrations for Mary Buff's Dancing Cloud, used strong desert colours to paint scenes of Navaho life. Quite different were the black and white drawings of Robert Lawson, who energetically interpreted the old nursery rhymes and ballads in Four and Twenty Blackbirds, compiled by Helen Fish. Two highly imaginative and amusing stories for younger children were Marjorie Flack's Walter, the Lazy Mouse and And to Think that I Saw It on Mulberry Street by "Dr. Seuss," the latter depicting in colourful comic art what happened when a boy with a lively imagination lived on a humdrum street. Fanciful tales were represented by Richard Hatch's whimsical Curious Lobster and by the Idyllic Martin Pippin in the Daisy Field of Eleanor Far-

jeon. A traditional fairy tale was the Seven Simeons with its delicate and decorative art work by the author-illustrator Boris Artzybasheff; the robust hero of the American cowboy was immortalized in Pecos Bill by James Bowman. Fiction took on various aspects, ranging from Arna Bontemps' Sad-faced Boy, to the pioneer tale On the Banks of Plum Creek by Laura Wilder, to the calm, quiet family scenes and joys of Alice-all-by-Herself by Elizabeth Coatsworth. Older boys and girls read The Great Tradition by Marjorie Allee, a picture of life at the University of Chicago, and Wind of the Vikings by Maribelle Cormack. The intrepid Polynesian explorers who sailed the sea lanes of the Pacific to reach finally the civilizations of the ancient Mayas and Incas were portrayed in Eastward Sweeps the Current by Alida Malkus. Non-fiction was represented by Julia Davis' No Other White Men, a dramatic account of the Lewis and Clark expedition; by an anthology of poetry Under the Tent of the Sky compiled by John Brewton and by The Boy Shelley of Laura Benet.

Picture books assumed a cosmopolitan air in 1938, for Ludwig Bemelmans in Quito Express wrote of a little Inca boy; Claire Bishop in The Five Chinese Brothers retold a humorous folktale; Munro Leaf, with the able assistance of the artist Robert Lawson, solved the problem of Wee Gillis and his conflicting Scotch loyalties; Nikolai Radlov presented Russian animal fables in The Cautious Carp and Other Tales and James Daugherty in Andy and the Lion gave a new twist to the old Greek tale of Androcles and the lion. Traditional literature was represented in fresh form by Ingri and Edgar D'Aulaire's translation of East of the Sun and West of the Moon, in Paul Leyssac's translation of Andersen's It's Perfectly True and

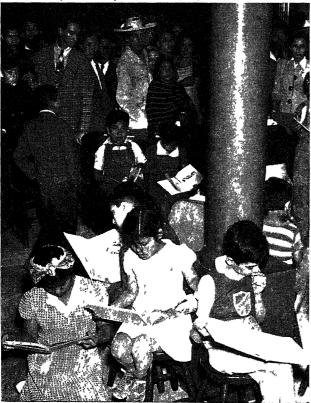
Illustration by Robert Lawson for Munro Leaf's Wee Gillis (1938)



Other Stories, in Merriam Sherwood's The Song of Roland and in Moritz Jagendorf's Tyll Ulenspiegel's Merry Pranks. Humour was found in The Three Policemen by William Du Bois, in Mr. Popper's Penguins by Richard and Florence Atwater and in the attractive new edition of Kenneth Grahame's The Reluctant Diagon, while The Hobbit, by John Tolkien, assumed permanent place on the shelves of the modern fanciful tale. Historical stories for young and old were represented by Mabel Hunt's Benjie's Hat and Phyllis Crawford's "Hello, the Boat" Christopher Plantin was featured in At the Sign of the Golden Compass by Eric Kelly and the yearning of a boy for a dog was expressed by Marguerite De Angeli in Copper-toed Boots. Shuttered Windows by Florence Means showed the need for adjustment by a northern Negro girl to the conditions and philosophy of her great-grandmother's people in South Carolina, while in The Iron Duke by John Tunis, an Iowa lad had equally serious problems of adjustment. Two outstanding stories with an English setting were The Far Distant Oxus by the teen age authors, Katharine Hull and Pamela Whitlock, and We Didn't Mean to Go to Sea by Arthur Ransome. Biography was enriched by Jeanette Eaton's Leader by Destiny (Washington), by Elizabeth Gray's Penn and by the growing-pains of The Young Brontës by Mary Jarden.

In 1939, the small child's delight in mechanical objects was satisfied by Virginia Burton's Mike Mulligan and his Steam Shovel, while funny bones were tickled by Ludwig Bemelmans' Madeline. Those liking suspense were rewarded by the fine writing and colour work in Cockadoodle doo by Berta and Elmer Hader, while Let's Go Outdoors by Harriet Huntington answered the nature

Mexican children examining juvenile literature at the U.S. exhibit during the fourth Mexican book fair in 1946. Nineteen nations were represented by more than 2,000,000 volumes



questions of the very young. Two noteworthy books with social implications were the poetic I am a Pueblo Indian Girl of Louise Abeita and the straight-forward Tobe of Stella Sharpe, illustrated with photographs of the daily activities of a rural Negro family. The need for laughter was supplied by Robert Lawson's inimitable Ben and Me, and Katharine Gibson in Cinders provided a sequel to Cinderella. The perennial interest in boys and their pets ranged from Alaska in Panuck, Eskimo Sled Dog by Frederick Machetanz, to the Philippines in Lucio and His Nuong by Lucy Crockett, to the West Indies in the hilarious Mouseknees of William White. The American scene was covered from 1837 in Stephen Meader's Boy with a Pack, to 1875, in Marjorie Allee's Runaway Linda to the colourful, turbulent days of frontier life in the Dakotas in the '70s and '80s in All the Days were Antonia's by Gretchen McKeown and F. S. Gleeson. Youth and modern problems were capably handled by Marjorie Bianco in Other People's Houses, and Dirk's Dog Bello by Meindert De Jong added another title to the list of favourite dog stories. The Singing Tree by Kate Seredy, a sequel to The Good Master, was a plea for world peace and understanding. Three biographies whose central characters were of European origin and whose paths led to America were Enchanting Jenny Lind by Laura Benet, Columbus Sails by Walter Hodges and Runner of the Mountain Tops, the story of the life and questings of Louis Agassiz, by Mabel Robinson. Other nonfiction interests ranged from Edwin Teale's Boys' Book of Insects to Marshall McClintock's Here is a Book.

Picture books continued gay and carefree in 1940 with the intrepid Hercules; the Story of an Old-Fashioned Fire Engine by Hardie Gramatky leading the parade. Claire Newberry, in her April's Kittens, told of the complications three new kittens bring to a "one cat apartment." Presents for Lupe was of a South American squirrel, illustrated in colour by Dorothy Lathrop, while Robert Mc-Closkey in Lentil delighted with the saga of an American boy and his harmonica, and The Great Geppy of William Du Bois brought many chuckles. Henri Christophe was presented in fictionized form by Covelle Newcomb in Black Fire and a selection of poems of Paul Dunbar appeared under the title of Little Brown Baby. Young Mac of Fort Vancouver by Mary Carr depicted early days on the Columbia, John Newbery's book store was immortalized by Alice Dalgliesh in A Book for Jennifer and Marguerite De Angeli wrote understandingly of the antics of a lively Quaker girl in Thee, Hannah! Sincerity, courage and an understanding of those less fortunate made Blue Willow, by Doris Gates, one of the brightest spots in the year. Animal stories were represented by Eric Knight's Lassie Come-Home and by On Safari by Theodore Wal deck. An unusual book was Mabel Pyne's pictorial Little History of the United States; Paul Revere's story was found in the simple biography, Early American by Mildred Pace. Biographies of writers were competently handled by May Becker in Introducing Charles Dickens, by Eulalia Grover in Robert Louis Stevenson, by Jeannette Nolan in Gay Poet; the Story of Eugene Field and by Claire Purdy in He Heard America Sing; the Story of Stephen Foster. Anna Hall in Nansen dramatically presented a famous explorer and humanitarian. Call of the Mountain by Cornelia Meigs was a mature junior novel, Fair Adventure by Elizabeth Gray was a story of modern youth. Traditional tales were represented by Eula Duncan's Big Road Walker, by the distinguished prose re-telling by Babette Deutsch of The Heroes of the Kalevala. Warren Chappell's book design and illustrations added greatly

A peak of children's book publishing was reached in 1941. Wanda Gag introduced colour into her illustrations for Nothing at all; Curious George concerned the lively antics of a monkey told and illustrated by Hans Rey, and Jo and Ernest Norling launched their popular series of informational picture books with Pogo's House; the Story of Lumber. Virginia Burton poked good-natured fun at the comics in Calico, the Wonder Horse, while Holling C. Holling's Paddle-to-the-Sea was a fortuitous blending of striking art work and strong text. Dorothy Lathrop's Colt from Moon Mountain was a delicate fantasy in contrast to the sturdy, realistic The Moffats of Eleanor Estes. Kate Seredy wrote poignantly in A Tree for Peter, and Elizabeth Tarshis added to the growing understanding of Mexico with The Village that Learned to Read. Older boys enjoyed Merlin Ames' Canthook Country, a story of lumbering in Wisconsin, and in The Saturdays, Elizabeth Enright gave a gay picture of family life in New York city. Tall tales of America were gathered by Ann Malcolmson in Yankee Doodle's Cousins, illustrated by Robert McCloskey. Richard Rostron made a contribution in The Sorcerer's Apprentice, illustrated in gay mood by Frank Lieberman. Biographies of three American leaders appeared: Poor Richard by James Daugherty, Haym Salomon by Howard Fast and Walt Whitman; Builder for America by Babette Deutsch. Leif the Lucky by Ingri and Edgar D'Aulaire and Finlandia: The Story of Sibelius by Elliott Arnold brought figures of Scandinavian countries to the attention of American boys and girls. Other nonfiction interests were represented by Ann Clark's simple account of the Indians of the Southwest in In My Mother's House and by Maud and Miska Petersham's novel American ABC. Mabel Pyne met the needs of younger children with her pictorial Little Geography of the United States. Lost Worlds by Anne White was a notable contribution to the field of archaeology, and Genevieve Foster, in George Washington's World, extended horizons and related the American scene to world activities of the period. Louis Untermeyer successfully introduced young people to poetry through Stars to Steer by.

Shadow of War.—Fewer children's books were published in 1942; a conscious stress on American ideals and the glory of America's heritage was noticeable, books with the shadow of war across their pages appeared and even the picture books had a more sober air. Mary and Conrad Buff in Dash and Dart combined poetic prose with magnificent art work; more carefree was The Story of Pancho and the Bull with the Crooked Tail by Berta and Elmer Hader; Mother Goose received new and unexpected treatment by Feodor Rojankovsky in his Tall Book of Mother Goose. Stories for the middle age group ranged from the philosophical East Indian Gift of the Forest by Reginald Lal Singh and Eloise Lownsbery to the story of the ubiquitous Mr. Bumps and his Monkey by Walter De La Mare; from the Cornish Doll Who Came Alive by Enys Tregarthen to the American winter's tale of The Long White Month by Dean Marshall and the carefree Houseboat Summer by Elizabeth Coatsworth. The American historical scene was also featured: Isabella McMeekin's Iourney Cake was a family's trek west to Kentucky in 1793, Gunsmith's Boy by Herbert Best was of the sufferings of 1816 and Kathryn Worth's They Loved to Laugh was North Carolina in the 1830s. Folklore was represented by Arna Bontemps and Jack Conroy in Fast Sooner Hound, by Harold Courlander in Uncle Bouqui of Haiti and by Irwin Shapiro in How Old Stormalong Captured Mocha Dick. An awareness of minority groups, their problems and the need for a practised democracy was noticed in Valenti Angelo's Hill of Little Miracles, in John Tunis' All-American and in Steppin and Family by Hope Newell. Outstanding in the nonfiction field were biographies and books dealing with the arts, of the latter Pictures to Grow up With by Katharine Gibson, Tune Up, a book of musical instruments by Harriet Huntington and Walter De La Mare's collection of poems Bells and Grass were all to be remembered. Biography ranged from Leonardo, Master of the Renaissance by Elizabeth Lansing, to Dancing Star (Pavlova) by Gladys Malvern, to a piece of Americana in the careers of Charles Stratton and P. T. Barnum in "Have You Seen Tom Thumb?" by Mabel Hunt.

The publishing of books was drastically cut by 1943; formats were affected by wartime restrictions, changes in weight of paper and type of illustration were necessary, yet children's books on the whole remained attractive. The war influenced the subject matter, as was to be expected. Of the picture books not so affected, Don't Count Your Chicks by the D'Aulaire's and Small Rain, a book of Bible selections, compiled by Jessie Jones and illustrated by her daughter Elizabeth Jones were memorable. A recognition of the need for spiritual values was seen in Rafaello Busoni's Somi Builds a Church. Gaiety and laughter were present in Gigi by Elizabeth Foster, in the rollicking episodes of Homer Price by Robert Mc-Closkey and in Mary Poppins Opens the Door by Pamela Travers.' Saint-Exupéry's Little Prince and Julia Sauer's Fog Magic were among the imaginative tales of distinction; folklore of Alaska and the Southern mountains was represented by Charles Gillham in Beyond the Clapping Mountains and Richard Chase in Jack Tales. Older girls appreciated the modern problems presented in Lavinia Davis' Stand Fast and Reply and enjoyed Laura Wilder's last book of the Ingalls family in These Happy Golden Years. Boys entered into the adventure of Starbuck Valley Winter by Roderick Haig-Brown and Gregor Felsen's Struggle is our Brother, while those craving mystery stories read Thief Island by Elizabeth Coatsworth. Two books of information with picture book format were Ann Hark's Story of the Pennsylvania Dutch and Henry Kane's Tale of the Crow. Mechanically-minded boys read What Makes It Tick? by Katharine Britton, and the interest in exploration and high adventure was answered by Mary Lucas' Vast Horizons. David Ewen wrote sympathetically yet realistically in his Story of George Gershwin and Hendrick Van Loon gave fresh interpretation to his subject in The Life and Times of Simon Bolivar.

During 1944, war-time formats continued to be much in evidence, and the 'slim book' seemed to acquire permanence. Despite publishing difficulties, the picture book harvest was a rich one. Georgie was the tale of a friendly ghost by Robert Bright, Katy No-Pocket by Emmy Payne, illustrated by Hans Rey, was about a kangaroo; boys and their problems were featured in the picture books, as in Angelo, the Naughty One by Helen Garett illustrated by Leo Politi; in Yonie Wondernose, the Amish boy, by Marguerite De Angeli and in the lively imaginings of Magic Michael by Louis Slobodkin. Lullaby by Josephine Bernhard was a reverent Polish folktale ideal for Christmas use. Caddie Woodlawn reappeared in Magical Melons by Carol Brink, Shoo-Fly Pie by Mildred Jordan was an amusing story of Pennsylvania Dutch, and Eleanor Estes in The Hundred Dresses wrote poignantly of a child's sufferings because she was "different." A modern fairy 631

tale was The Great Quillow by James Thurber. Older girls enjoyed the naturalness of Granite Harbor by Dorothy Bird, envied and yearned to be like the heroine in Alice Dalgliesh's Silver Pencil and endured again the hardships of the pioneers in Erick Berry's Hearthstone in the Wilderness. Older boys had a variety, from Wilderness Champion by Joseph Lippincott, who combined a dog story with adventure in the wilds of Canada, to Buckeye Boy by Marjorie Medary, about early newspaper days in Ohio. The realm of nonfiction was a rich one, with Travellers All by Irma Webber being a simple account of the travels of plants; Electronics for Boys and Girls by Jeanne Bendick kept pace with the times; Abraham Lincoln's World by Genevieve Foster offered a background for understanding world events, and One God, the Ways we Worship Him by Florence Fitch was a book long needed. Biography largely concerned those who had fought for freedom of thought and action, as in Lone Journey (Roger Williams) by Jeanette Eaton, in Dr. George Washington Carver, Scientist by Shirley Graham and G. D. Lipscomb and in Peter the Great by Nina Baker. Raymond L. Ditmars by Laura Wood fascinated both boys and girls, bringing in much of the contemporary

Picture books in 1945 seemed less gay and spontaneous, though Little Lost Lamb by Golden MacDonald was outstanding for the quality of the art work of Leonard Weisgard; Russia was the setting for the delightful My Mother is the Most Beautiful Woman in the World by Rebecca Reyher. Lee Kingman in Ilenka gave a different picture of Russian life, while democracy at work in the United States was the theme of Lorraine and Jerrold Beim's Two is a Team. The modern fanciful tale was well handled by Phyllis McGinley in The Plain Princess. Jean Bothwell in Little Boat Boy demonstrated the universality of boy-

One of Doris Lee's illustrations for *The Great Quillow*, by James Thurber, a story of how an ingenious toymaker outwitted a giant. The book appeared in 1944



hood in her story of India, and Delia Goetz offered humor in The Burro of Barneygat Road. Wind Island by Hedvig Collin was sensitively written, and Justin Morgan Had a Horse by Margaret Henry pleased both boys and girls. Older boys lived 4-H activities with Gid Granger by Robert Davis and older girls faced modern problems with Sandy by Elizabeth Gray. A well written historical story was Katharine Gibson's Arrow Fly Home, and Irish wit and imagination characterized Maura Laverty's Gold of Glenaree. Three stories with social implications were Doris Gates' North Fork, concerning the Indians of California, Call me Charley by Jesse Jackson concerning the Negro, and The Moved-Outers, a fearless and unemotional story by Florence Means of a Japanese relocation centre in Colorado. The nonfiction field showed variety in Alex Novikoff's Climbing Our Family Tree, in Ruth Brindze's Gulf Stream and in Katherine Shippen's New Found World. Barbara Geismer compiled, with others, an anthology Very Young Verses and Norma Cohn in Little People in a Big Country added to the child's appreciation of poetry and art.

By 1946, there was a number of new editions of old favourites, and titles temporarily out of print during the war years were made available again. Many popular authors and illustrators made contributions, the D'Aulaire's in Pocahontas and Louise S. Bechtel in The Brave Ban tam, illustrated by Helen Sewell were welcomed back. Leonard Weisgard's pictures were a distinct feature of Golden MacDonald's Little Island; Grace Paull tickled the funny-bone with Pancakes for Breakfast, and Muriel Fuller in The Runaway Shuttle Train added to the pleasure of the mechanically minded little boy. Folk and fairy tales were represented by the compilation Big Music by Mary Bleecker, by Pura Belpre in The Tiger and the Rabbit and by Eileen O'Faolain in Miss Pennyfeather and the Pooka. Horse stories for girls were popular with Regina Woody's Starlight standing out; Strawberry Roan, by Don Lang, pleased boys, as did Cowboy Boots by Shannon Garst. Vanya Oakes in The Bamboo Gate wrote of modern China and Phyllis Coté in The People Upstairs was again successful in her portrayal of happy family life. Authors whose works had won previous acclaim were represented in John Tunis, Howard Pease and Stephen Meader while Alice Dalgliesh wrote a sequel in Along Janet's Road. Marguerite De Angeli, Jo Besse Waldeck and Katherine Eyre also published stories and Nancy Barnes in The Wonderful Year pleased girls of the middle grades. Astronomy, natural science and paper-making were handled adequately and biographies were popular. The first postwar year was a rich one.

Books on Reading.-Many books about children's reading interests and habits, and often concerned with the children's books themselves, appeared during the decade. In 1940 Anne Eaton in Reading with Children gave concrete, practical suggestions as to books boys and girls had enjoyed. The previous year, My Roads to Childhood appeared, a selective compilation of many of Anne Carroll Moore's essays on children's authors, illustrators and on children's reading itself. In 1944 Annis Duff, a mother. librarian and author, wrote of her family's joy in reading together and living daily with books in Bequest of Wings and that same year, out of war-torn France, came Paul Hazard's scholarly and very human Books, Children and Men. With such to inspire and guide the adult, the right and opportunity of children to enjoy their reading seemed assured for years to come.

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Children's Bureau, United States

See CHILD WELLARE.

Child Welfare

The first two years of the period 1937–46 revealed a general movement toward improving the conditions of child life, although under the retarding effects of the uncertain international situation. With the outbreak of World War II in Sept. 1939 children began to suffer from lack of food, loss of parents and home, displacement, disease and other misfortunes, with grave consequences for their future. Great numbers of them, who would have survived in normal times, lost their lives. The extensive relief work done in devastated areas by several organizations, notably the United Nations Relief and Rehabilitation administration could not meet all the needs. In the countries that were not involved in the war, children were also affected by the reduced supply of the necessities of life and by other war consequences.

The end of hostilities was followed by a general movement for reconstruction and for the preparation of a better future for children. Plans for aiding in this work through international effort were considered by those agencies of the United Nations devoted to social and humanitarian purposes. At the same time, rebuilding on behalf of children began in a number of individual countries.

Continental Europe

Child Health in France.—Particularly extensive plans were reported from France in 1945, where the government ordered the organization of health services for children on a nation-wide scale. For this purpose the departments (administrative divisions of the territory of France) were divided into districts, each to have a prenatal clinic, a clinic for babies and young children and another for preschool children. Women were required by law to go to the prenatal clinics for at least three examinations during pregnancy and one in the month after childbirth. These visits were made a condition for receiving the various benefits paid under the social security laws.

Medical supervision was also instituted over the health of children. Well babies and preschool children had to be brought at stated intervals to the clinics for medical examinations, and regular attendance was rewarded by prizes to the mothers. Special attention was given at these clinics to children not receiving proper care in their own homes. Supervision over the work was entrusted to the

public health officials of the department.

Also in 1945, in an effort to improve the school children's health, a law was enacted for the setting up of a nation-wide uniform system of school-health services, which until then were available only in some localities. The parents or guardians were now required to present their children for free medical examinations; during the sixth year, before the beginning of the school-attendance period. Medical care for any illnesses discovered in the course of these examinations had to be provided by the parents at their expense. All children attending school were required to submit themselves to medical examinations at specified intervals; the cost of this service was borne jointly by the parents and the government. Teachers and other employees of the school coming in regular contact with the children were also required to undergo regular examination.

The employment of social workers in connection with the health services for mothers and children likewise was required after 1945. Specific measures were prescribed for enforcement of the laws, which were to be put into effect by degrees.

Another French reconstruction measure was an increase in the various benefits paid to parents since before the war in an effort to raise the birth rate and to provide better care for children. The regulations on this subject were combined in one law on Aug. 22, 1946, retroactive to July 1, 1946. They called for the following payments:

- 1. Childbirth benefits payable in the form of a lump sum on the birth of each child, provided specified conditions were met as to the mother's age and the period of time elapsed after marriage or after the previous childbirth.
- 2. Family allowances for the second and each subsequent child, from birth until the end of the compulsory school-attendance period and later, if the child continued his studies or was unable to work because of a permanent disability.
- 3. Single-wage benefits for couples whose income consisted of the wages of husband or wife only. This benefit was to be paid, beginning with the first child, for the same period as the family allowance and in addition to it. The rate of payment of the family allowances and single-wage benefits varied with the number of children and the locality.
- 4. Prenatal benefits, intended to help meet the expenses incidental to childbirth and payable in the combined amount of the family allowances and the single-wage benefits. They were paid from the day on which the mother reported her pregnancy in her application for these benefits and until the end of the pregnancy. Under some conditions the payments were made for nine months. The benefits were made conditional on the mother's attendance at a prenatal clinic and her observance of the instructions issued there. All these benefits and allowances were paid through the social security funds, to which contributions prescribed by law were made by the workers, the employers and the state.

To achieve unity and greater effectiveness in health services, the government in 1945 placed under the control of the public-health authorities all maternity hospitals, child-health centres, clinics for children and day nurseries.

The legislation on sickness and maternity insurance, which had been in operation in France for 15 years, was revised in 1945. As formerly, it extended its protection to mothers and children. An employed worker, whether man or woman, who was subject to insurance, received

cash benefits in case of illness. In addition, the insured person and dependents received medical care and medicines. Medical care was also provided in pregnancy and childbirth to a woman insured in her own right and to the wife of an insured man. The former received also a daily cash benefit for six weeks before childbirth and eight weeks afterward, on condition that she gave up paid employment during that time.

Russian Program for Child Health.—In the soviet union, the national policy of giving careful attention to the needs of mothers and children was continued throughout World War II. In the face of many difficulties the government laid particular stress not only on maintaining the health services at prewar levels but also on improving them. To this end, measures were taken in 1942 for the appointment of a sufficient number of physicians to the staffs of child-health centres in the territories which were not invaded by the Germans. In the same year the government ordered the division of the country into districts with a pediatrician in each for supervising child-health services.

Efforts to counteract the ravages of the war were seen in the often-quoted law of July 8, 1944. By this law, the government was directed to establish in various localities additional child-health centres, milk stations, day nurseries and other facilities. The law also ordered: (1) the lengthening of the period of maternity leave for women employed in factories and offices to a total of 77 days, during which time their employment was prohibited and their wages paid in part or in full; (2) an increase in the childbirth allowances paid under social insurance to help the mother obtain clothing and other articles for the baby; (3) an increase in the grants available since 1936 to mothers for the care of their children-grants consisting of single payments, varying with the number of children born previously and payable at the birth of each child, beginning with the third, and of monthly allowances beginning with the fourth child and payable for four years from that child's first birthdate to his fifth; and (4) aid to unmarried mothers paid monthly for each child from birth until the age of 12 years.

Official statements on the enforcement of this law revealed in 1945 and 1946 the organization after July 1944 of additional facilities in many localities in compliance with the law, although in other regions the public authorities failed to do so. Among the new facilities mentioned were 25,000 maternity beds, day nurseries for 60,000 children and sanatorium-kindergartens for 45,000 children. Also, as a result of the increased medical personnel, 86% of childbirths in the cities were attended by physicians during the first half of 1945, against 71% in 1943. The proportion of children under one year of age brought up under the supervision of child-health centres went up to seven-eighths for the entire country.

Sanatoriums for children in farming districts, homes for unmarried or widowed mothers with their children, schools for parents and institutions for war orphans were opened in large numbers. Greater attention was given to children's vacations, and permanent committees for increasing the number of vacation camps were organized as parts of the municipal governments.

A project for still more comprehensive maternal and child-health services was included in the fourth five-year plan for the reconstruction of the country, approved by the government in March 1946.

Health Measures in Sweden.-Sweden, which was for-

tunate to escape the devastation of World War II, still felt the stress of war in food shortages and other economic restrictions. Nevertheless, the country proceeded on its usual course of forward-looking social action.

The reforms in maternal and child health ordered by the laws of 1937 were implemented in the following year, and the work continued, with a gradual expansion, even during the war. Under these reforms the government made grants to the administrative districts and to the cities outside these districts for maintaining prenatal clinics and child-health centres. At the clinics, women were examined during pregnancy and treated for disorders connected with it. Babies and young children were examined at the child-health centres, and their growth and development were watched; measures were taken in case a child failed to receive proper care in his home. All these services were free.

Also after 1937 the government had given financial aid in a specified amount, at the time of childbirth, to women of small means not covered by sickness insurance. Through these funds, advice was also provided to each woman on care of herself during pregnancy, confinement and the postpartum period, and on care of her child. At the same time additional aid was introduced, again from the government treasury, in the form of gifts or loans up to a certain amount, to indigent women during pregnancy or soon after childbirth. Specially established local "boards of aid to mothers" made certain that the money was used for the proper purpose.

Free attendance at childbirth for all women was made possible under a law of 1937 which was revised in 1943. The country was divided into midwives' districts, in each of which one or more midwives were employed. Their salaries were paid from the national treasury on condition that they attend cases of childbirth without charge. Early in 1944 the salaries of these midwives were increased, and new regulations on continuation courses for them were issued.

Health services for school children, which prior to 1941 existed only in the larger cities, were extended in 1945 to smaller cities and rural districts with government grants for the employment of physicians and nurses. From 1937 annual grants had been made by the government for school lunches, which previously were provided in some cities at the expense of the city or town or of private organizations. A decree of 1946 provided government aid for free school lunches for all children not only in the primary schools, as previously, but also in intermediate, high and technical schools.

Day nurseries, kindergartens and after-school centres were placed under government control in 1943 and received government aid. Such aid was available also to provide free vacation travel for children and, separately, for mothers of low-income families.

Dental care for the general population, including children, had been available since 1939, either free or at a nominal charge.

Other measures in Sweden called for: (1) monthly allowances, payable under a law of 1937, for the benefit of children under 16 who were orphans, or whose mothers were unmarried, or whose parents were permanently incapacitated; (2) government aid, begun in 1945, to administrative districts and independent cities for the establishment of clinics for the treatment of mental disorders in children; and, (3) supervision, begun in 1946, by a government agency over children less than 16, placed in foster families for pay or free of charge, whereas previously such supervision applied only to children placed for pay.



Day nursery for Polish children being conducted against the background of Warsaw's ruins after the close of World War II

School Attendance and Employment.—A movement for raising the school-leaving age and with it the minimum age for employment, begun before 1937, was interrupted by the outbreak of war. The school-leaving age in France was raised late in 1936 from 13 to 14 years, and in 1946 measures were prescribed for better enforcement of this law. Norway, by a law of 1936, effective in 1937, prolonged compulsory school attendance until the child finished a specified grade, which might be between the ages of 14 and 16 years. The minimum age for full-time employment was correspondingly raised in both countries. In Switzerland, where school attendance was regulated by the individual cantons, a federal law of 1938 raised the minimum age for full-time employment from 14 to 15 years with the consequent necessity for the cantons to raise the school-leaving age. Annual vacations with pay for workers under 18 were made obligatory on employers in Finland, France and Sweden in 1946.

Services and Family Allowances.—In Finland, all child-welfare work was centralized in one official national agency, established under a law of 1936 which became effective in 1937. This agency functioned with the aid of a network of local welfare boards. The boards or their child-welfare divisions were entrusted with the care of children under 16 who were dependent, or morally or physically neglected, or had violated a law, and those under 18 engaged in occupations prohibited to them by law.

Family allowances were paid monthly to workers with dependent children, in addition to their wages, out of a fund financed, as a rule, by specified contributions from employers and administered by the government. Such allowances were in operation in several European countries before 1937. After that time they were introduced in Hungary by a law of 1938; in the Netherlands, 1939; Spain, 1938 and 1941; and Czechoslovakia, 1945. In France the previously enacted laws were amended and codified in

1939 and 1946. In Italy and Germany, the application of the system was extended to additional groups of workers in 1937 and 1940 respectively.

Juvenile Courts.—Juvenile courts, which had been functioning in many European countries before 1937, were introduced in Rumania and Luxembourg by laws of 1937 and 1939. Changes were made in the legislation of several other countries.

France, in an effort to deal with increased juvenile delinquency, completely revised in 1945 a juvenile court law passed in 1912. The new law stressed the importance of probation and of more effective use of social-welfare measures in the treatment of young offenders.

In the soviet union, where a special procedure for dealing with cases of young offenders had been followed for some years, the government in 1941 ordered the use of lay assessors in courts hearing such cases. These assessors were selected from among school teachers, child-welfare workers and other persons active in welfare work. Beginning in 1943, the cases of children under 16 were heard in larger cities by special divisions of the people's courts. In other cities such cases were required to be heard on separate days, on which no other cases were heard. In 1943, the government ordered the exercise of special care in the appointment of judges for hearing cases of young offenders.

Spain, where juvenile courts were in operation under a law of 1918 and subsequent laws, amended and codified these laws in 1940. In Sweden, where no juvenile courts were in existence but cases of young offenders were referred either to the public child-welfare boards or to the regular courts, provision was made in 1937 for better institutional care. In 1939, 1944 and 1945, laws were enacted for the preliminary investigation of such cases and for more extensive use of medical examinations, probation and parole.

Switzerland where juvenile courts for many years were regulated by the laws of the individual cantons and, therefore, lacked uniformity, attempted to introduce uniformity through the federal penal code of 1938, which went into

effect in the entire country in 1942. This code prescribed general rules for the treatment of cases of young offenders but left the details to individual cantons. Stress was laid by the penal code on the participation of welfare agencies in the work of the juvenile courts.

Great Britain

The constructive efforts in Great Britain early in the period 1937–46 were interrupted by the outbreak of hostilities in 1939. Evacuation of expectant mothers and of children from dangerous areas, separation of families, interruption of school attendance, absence of parents from the home and other misfortunes all cast their shadows on child life. But even in the midst of war, the public authorities were able to provide most of the health services of normal times, including school medical services, childhealth clinics, public-health nursing and maternity care. In consequence, gratifying results were noted in the vital statistics reported by the chief medical officer of the ministry of health for 1939–45.

The birth rate, which was 14.8 per 1,000 living persons in 1939 and showed a slight decrease in the next two years, rose to 15.6 in 1942, 16.2 in 1943, and 17.7 in 1944. The infant mortality rate per 1,000 live births, a reputedly reliable index of health conditions, was 51 in 1939; after a rise to 57 and 60 in 1940 and 1941 respectively, it went down, despite wartime difficulties, to 51 in 1942, 49 in 1943, and 45 in 1944. The maternal mortality per 1,000

British children being evacuated from London during the height of the German robot bomb raids. As in the days of the 1940 blitz, hundreds of women and children left London for safer areas during 1944 and 1945



total births decreased gradually from 3.10 in 1939 to 2.62 in 1940, 2.47 in 1942, 2.30 in 1943 and 1.92 in 1944. These encouraging reductions were attributed to special arrangements for the nutrition of expectant mothers and of babies and to good medical care.

The nutritional state of the nation as a whole was reported not worse at the end than at the beginning of the war, despite food restrictions, and, as regards children, it was somewhat better. This was attributed to a more suitable and balanced children's diet.

Plans for more extensive health services for the entire population also continued in the midst of war. Among such plans, wide attention was attracted by the report on Social Insurance and Allied Services by Sir William Beveridge published in 1942. This report was used by the British government as a basis for a plan presented to parliament in 1944 which called for the organization of a comprehensive system of medical care available free of charge to everybody, regardless of age, sex, financial condition or occupation. Treatment was to be given for all ailments, physical or mental, and was to include surgery, dental care and nursing care. Another plan, also based on the same report, provided for the following kinds of benefits: (1) family allowances; (2) social insurance, with more liberal benefits (payable in case of unemployment, sickness, childbirth or retirement), widows' benefits (payable for short periods), widows' pensions, orphans' allowances and funeral benefits; and (3) "national assistance" for the purpose of meeting any special needs not covered by insurance benefits and the needs of all persons not qualified for such benefits.

These plans were gradually implemented by legislation. In 1945, the Family Allowances act was passed, and on Aug. 6, 1946, about 2,000,000 mothers drew the first instalment of their weekly allowances of 5s. (approximately \$1.00) for every child, except the first. These allowances were paid for children under 16, and those older if they were serving as apprentices or attending school. In July 1946, a bill providing for a free and comprehensive health service for all citizens passed its final stages in the house of commons. The National Insurance act of Aug. 1, 1946, also followed the main lines of the Beveridge proposal; it unified the existing provisions into a single system of social insurance covering the whole population and providing a single scale of benefits in all cases of lost earning power.

Among the other important measures for postwar reconstruction was the Education law of England and Wales of 1944. This law superseded all previous laws and, in particular, repealed the Education act of 1936, which was to have gone into operation on Sept. 1, 1939, but was suspended because of the outbreak of war. Under the new law, the present school-leaving age of 14 years was to be raised on April 1, 1947, to 15 years; and, subsequently, when sufficient buildings and teachers became available, to 16 years. After boys and girls had passed the age for full-time compulsory school attendance, they would be required to attend part-time county colleges at least until the age of 18, if they were employed; otherwise full time. The tuition was to be free. Under this law the employment of school children was to be prohibited or restricted.

The legislation on full-time employment of children and young persons in factories and other work in England, Wales and Scotland was revised in 1937 and 1938. A minimum age of 14 years was prescribed; a 44-hour week tor children between 14 and 16 and a 48-hour week for those between 16 and 18. Night work was prohibited tor children under 16.

The beginning of hostilities, increasing the demand for

manpower, immediately brought about longer hours of work for young persons, particularly in establishments filling emergency orders. Soon, however, the evils of this policy became apparent in a lowered production level and in increased loss of time because of sickness or fatigue. Accordingly, working hours were shortened, and the government announced that the child-labour law would be fully enforced in its application to the working hours for children and young people.

British Dominions

The world-wide recognition of the need for social security was evident also in the British Dominions. In New Zealand, the Social Security act of 1938 was amended at least twice and was being put into effect by degrees. For mothers and children, the act provided medical and hospital care, medicines and other appliances for insured persons and their dependents. Maternity care, services by specialists and dental treatment were also included. Family allowances, previously payable for the third and each subsequent child under 16, were paid also for the first two children after April 1, 1946. All these benefits were avail able to the residents of New Zealand without extra charge, except the contributions regularly required under the law.

In Australia, where a somewhat similar law was enacted in 1938 but was not put into effect because of subsequent wartime difficulties, plans were made after the war for a comprehensive system of social security. In the meantime, a law on unemployment and sickness benefits was passed in 1944, and other forms of aid were also given to parents. Among them were maternity allowances paid since 1912 in a single sum on the birth of each child and increased in 1943, when they became available to any woman regardless of income. Widows and divorced and deserted wives with one child under 16 received pensions after July 1, 1942, and all parents were entitled after 1941 to regular allowances for two or more children under 16.

In Canada, family allowances paid since July 1, 1945, for each child under 16 varied from \$5.00 to \$8.00 a month, depending on the child's age and the number of children in a family.

With further regard to child health, a permanent Commonwealth Council for National Fitness was organized in Australia in 1939, and councils on physical welfare and recreation in New Zealand in 1937 and in the Union of South Africa in 1938. National official agencies were appointed during the decade in Australia, New Zealand and the Union of South Africa to find ways of improving the nutrition of the people.

Reorganization and expansion of child-welfare services and establishment of juvenile courts were the subjects of laws in the Union of South Africa (1937), New South Wales (1939) and in some provinces of Canada, among them Quebec, and in Newfoundland (1944).

The minimum age for full-time employment was raised in 1941 in the Union of South Africa from 14 to 15 years, in compliance with the convention on that subject revised in 1937 by the International Labour conference. Closely connected with employment was the school-leaving age. Although wartime demands on manpower brought about exemptions of children from school attendance, progress was reported from some places. In New Zealand, the school-leaving age was raised in 1944 to 15 years, and employment of children of school age was prohibited during school hours. In New Brunswick, Canada, where school attendance had previously been compulsory only in a tew towns, a law of 1941 made attendance up to 14 years compulsory throughout the province and prohibited the em-

ployment of school children during school hours, with some exceptions. Two years later a 14-year minimum age was ordered there for employment in factories. In Quebec, a law effective in 1943 required children to attend school until the age of 14.

United States

Though the destructiveness of war dominated the period 1937-46, positive gains were made in child welfare. Ten years of actual operation of the Social Security act, passed in 1935, virtually coincided with the decade. The act recognized the needs of children as an integral part of a broad economic and social program by providing for aid to dependent children administered by the Social Security board (see Social Security) and for maternal and child health, crippled children and child-welfare services, administered by the children's bureau of the U.S. department of labour, later of the Social Security administration, Federal Security agency. All three of the bureau programs were to enable the states to extend and improve these services, especially in "rural areas and in areas suffering from severe economic distress" or "areas of special need." Allotments were granted on the basis of plans submitted by the states and approved by the bureau.

Amendments to the act in 1939 and 1946 increased the amounts appropriated for the grants. The increases brought annual appropriations for maternal and childhealth services to \$5,820,000 in 1939 and to \$11,000,000 in 1946; for crippled children's services to \$3,870,000 in 1939 and to \$7,500,000 in 1946; and for child-welfare services to \$1,510,000 in 1939 (an addition of \$10,000 in order to include Puerto Rico) and to \$3,500,000 in 1946. Half of the federal grants had to be matched by state or local funds in the two health services. Grants for child-welfare services did not need to be matched, although federal funds could be used for only part of the cost of local services. Federal grants, supplemented by state and local funds, were only a part of the total amounts spent for the programs.

Maternal and Child-Health Services.—One of the basic services of this program, administered by the state health agencies, was the health supervision of expectant mothers by physicians in maternity clinics, with instruction by public-health nurses and nutritionists as to hygiene and diet during pregnancy and the nursing period. Because of limited funds, state agencies did not attempt to provide care at childbirth for all mothers needing care, but a few demonstrated complete maternity care on a public-health basis, developing home and hospital delivery service with medical and nursing supervision throughout pregnancy and the postpartum period.

State agencies made wide use of another basic service—child-health conferences to protect the health of children and to prevent illness. In these clinics, physicians examined children and in reporting their findings to the mothers, recommended certain care. Public-health nurses interpreted the doctors' instructions to the mothers.

School health services received more attention after V-J day. Nutrition and dental services—the latter mostly for school children—immunization against disease, and measures for preventing congenital syphilis were carried on in many states, and some mental health programs appeared.

By the end of 1942, programs of limited extent in about half the states were providing maternity care to servicemen's wives who were having difficulty in getting medical care through their own resources. Congress made the first

special appropriation for this purpose—\$1,200,000—in March 1943 for the remainder of the fiscal year and for the next four fiscal years the following appropriations: 1943–44, \$29,700,000; 1944–45, \$45,000,000; 1945–46, \$38,049,900; and 1946–47, \$16,664,000.

The children's bureau made grants to state health agencies on the basis of plans they submitted for maternity care for wives during pregnancy, at childbirth and for six weeks thereafter, and for babies under one year of age, medical, nursing and hospital care, if needed. Eligible for care were wives and babies of men who were or had been during their wives' pregnancy or the baby's first year in the four lowest pay grades of the armed forces, or were aviation cadets. Care was given regardless of residence, family income or race.

From April 1943 through Oct. 31, 1946, care was authorized for more than 1,340,000 maternity and infant cases. The peak of the program came toward the middle of 1944, with the number of cases authorized reaching almost 47,000 in the month of June. During the year 1945 an average of about 37,000 cases a month were authorized for care. There was a marked downward trend during 1946; from Aug. 1 to Oct. 31 the average number of cases authorized was about 17,000 a month. Most of the care was authorized for wives, but there was a steady increase in the proportion of care authorized for babies; in the period Aug.—Oct., 1946, about 30% of all cases authorized were infant cases.

Services for Crippled Children.—Federal grants were authorized under the act to help state agencies extend and improve "services for locating crippled children and for providing medical, surgical, corrective and other services and care and facilities for diagnosis, hospitalization and aftercare for children who are crippled or who are suffering from conditions which lead to crippling." Although state agencies gave primary consideration during this period to children with conditions requiring orthopedic or plastic care, some developed programs for other types of physical handicaps. Twenty states developed care for children with rheumatic fever or heart disease, and a few started special services for children with cerebral palsy, impaired hearing, specific visual defects and diabetes.

More than 100,000 children, it was estimated, received services yearly during this period. During the war the shortage of medical personnel for the care of civilians, especially of orthopedic surgeons, stopped expansion of the work. The number of children admitted to clinic service during 1944 was 15% below the corresponding figure for 1941, and the number of individual children under care in hospitals during 1944 was 24% below the figure for 1941. By the autumn of 1946, however, a number of surgeons, nurses, physical therapists and medical social workers needed in the program had returned to their posts.

Child-Welfare Services.—Before passage of the Social Security act, only 26 states had in their public welfare agencies divisions responsible for providing or supervising services to children on a state-wide basis. Although nearly all states had laws giving the state some responsibility for the care and protection of children, many had no public service primarily for children on a state-wide basis except an institution for delinquent children, or, perhaps, for dependent children. After 1935, the states accepted more and more responsibilities for direction and leadership of programs affecting children, and laid a foundation on which to build a broad program of state-wide, local public social services for children.

The basis of the child-welfare program was a specialized case-work service whose achievement depended on the professional education and skill of the worker, on creative supervision of her work, and the accessibility of this worker to parents and children. In spite of the definite progress the program made during 1937–46, limitation of funds kept it relatively small. Scarcity of qualified workers for rural areas was also a handicap. As of June 30, 1945, only one specialized worker paid from federal, state or local funds was available for approximately every 25,000 children under 21 years of age throughout the country. More than half of these approximately 2,000 specialized workers were employed in 8 states having less than one-third of the child population of the United States.

Federal grants stimulated the expenditure of more state and local funds for children's services and provided the services of supervisors and consultants on state staffs who had made more effective and more equable the services received by children. The grants also made possible educational leave for workers. In addition, broader concepts of services to children permeated the state and local programs; for example, that children should receive services in their own homes early, while family conditions were improvable; that services should be available locally; that the community should organize for the welfare of all the children living there; and, during the latter years, an emphasis on the prevention of social handicapping of children and on making social services available to any child who needed them, regardless of the family's economic status. Related to the first concept was the fact that of the 187,710 children receiving case-work service in 40 states from state and local departments of welfare on Dec. 31, 1945, 44% were living with their parents or relatives, 37% in foster-family homes, and 19% in institutions or elsewhere.

U.S. Children and the War.—The children of the United States fared well during World War II compared with the children of other warring countries; but they did suffer. Many lost their fathers; many were uprooted from their homes; some got too little parental supervision; and many suffered from the housing shortage and school curtailment, and from family dislocations. Children in migrant families harvesting the hand crops in industrialized agriculture lived under almost intolerable conditions, with little help from the communities they lived in temporarily during harvesting.

Only one group of children was directly affected by military evacuation—children in the families of Japanese ancestry living in military zones 1 and 2 on the west coast, considered potential combat zones. Nearly 120,000 individuals, about two-thirds citizens and more than one-fourth children under 15 years of age, were evacuated to relocation centres in the interior by army order. It was impossible to measure the emotional injury to these second and third generation American children caused by mass uprooting from their homes and by the hostile attitudes in some relocation communities and in their old localities when they returned after the exclusion order was lifted. That nearly the whole group met the ordeal in a remarkably self-disciplined, reasonable way probably lessened for the children the destructive effect of this experience.

The congested "defense areas," concentrations of military personnel or war workers, were backgrounds for much of the danger to children and for the struggle to give them protective health and social services. About 400 local areas, involving at least 500 counties and more than 1,000 communities, were termed critical defense areas. Hun-



Nursery of a war plant in Buffalo, N.Y., where children were cared for while their mothers worked in the plant

dreds of other towns in the vicinity were affected by the overcrowding as services were stretched thin to cover increased numbers. Thousands of families lived in trailers in open fields. From these "homes" and from improvised shacks, many parents went to work, leaving their children to fend for themselves during the work shift. Schools were overcrowded; teachers were few; playgrounds scarce. Many adolescent boys and girls were living unsupervised in places to which they had gone alone for war jobs or to be near camps. Maternity and pediatric care was seriously inadequate because of overcrowding and the rapid withdrawal of physicians and nurses for the armed forces. Surveys showed that many defense areas had only 1 physician to 2,500 persons and some had only 1 to 4,000 or more in contrast to the prewar ratio for the United States of 1 to 850 persons and for the large cities as high as 1 to 400.

Responsibility for nonmilitary protection of civilians was placed with the Office of Defense Health and Welfare Services and the Office of Civilian Defense. The office of education and the children's bureau co-operated with these agencies in planning for children. Among other forces that combined to hold the lines was the children's bureau Commission on Children in Wartime appointed by the chief of the bureau early in 1942. The commission published A Children's Charter, a ten-point program for state action, suggesting legislation needed for the wartime protection of children; ten goals for children and youth in the transition from war to peace; and Building the Future for Children and Youth, a broad program of action to extend official health and social services for children. In 1944, the body became the National Commission on Children in Wartime and in 1946, the National Commission on Children and Youth.

Of significance to children was the wartime nutrition program initiated by the Office of Defense Health and Welfare Services. The National Nutrition Conference for Defense, held in Washington at the call of the president in May 1941, set the country-wide program. The rationing of scarce foods kept nutritional levels normal. Many families were able to purchase more and better food than they had in the previous decade because all employable members were able to get work. Price control and rationing of scarce foods helped to ensure a fair distribution of the national food supply. After controls were relaxed, beginning in July 1946, many homemakers found it more difficult to feed their families satisfactorily.

The school lunch program, started in 1935 as a depression measure, was continued as a wartime need. In June 1946, the National School Lunch act made the program permanent through grants to the states to establish and operate nonprofit school-lunch programs. The department of agriculture was designated to administer the grants, for which congress appropriated \$75,000,000 for 1946–47.

Juvenile Delinquency.—The exact amount of juvenile delinquency in the United States was not known—there were no statistics that measured its extent. Nevertheless, it was popularly believed during the war that delinquency was increasing, especially in congested areas that exposed children to unusual stress. It was true that young people were quick to feel the excitement and restlessness of wartime, but those who could be called "delinquent" or who had court experience were a small minority; most boys and girls behaved admirably.

The juvenile-court statistics of the U.S. children's bureau, reported by about 400 courts in a series begun in 1927, threw light on the question of trend. The reports of 76 courts in urban areas showed an increase of 65% in delinquency cases disposed of by these courts from 1938 to 1945. The year-to-year increase was greatest in 1943. A relatively larger increase was shown in girls' cases disposed of (76%) than in boys' cases (63%), although girls' cases continued to be only one-fifth of the total.

The 1945 data in the bureau's series, from 374 courts serving areas with about 37% of the country's population, showed 122,851 delinquency cases disposed of. Of this

total, 82% were boys' and 18%, girls' cases. The greatest concentration was in the 14- and 15-year old group—36% of the boys' cases and 43% of the girls' for which the age of the child was reported. Of the 374 courts reporting on delinquency cases disposed of in 1945, 364 reported also in 1944. The total number of delinquency cases disposed of in 1945 by these 364 courts was 6% higher than in 1944.

The children's bureau revised its reporting plan, effective Jan. 1946, with the purpose of improving the national collection of juvenile-court statistics. The bureau discontinued the direct collection of reports from individual courts in favour of state summary reports. The revision also made possible an unduplicated count of children whose cases were disposed of, officially or unofficially, by the courts in cases of dependency, neglect and special proceedings as well as of delinquency.

Among the efforts of the children's bureau to prevent wartime delinquency were: a study of the effect of war conditions on the behaviour of children and young people in ten congested areas, made during 1943 in order to plan ways of helping boys and girls; a demonstration project in a war-expanded city; co-operation with the International Association of Chiefs of Police, the National Sheriffs' association, and the Division of Social Protection of the Office of Community War Services in considering development of special training of police for work with juveniles and of closer working relationships between police and other local agencies dealing with children; and intensified work for clearing up the inexcusable conditions under which many children were being detained.

The National Commission on Children in Wartime devoted its 1943 meeting to the problem of delinquency. On its request the children's bureau issued a publication, Controlling Juvenile Delinquency, widely used as a guide for strengthening the services fighting delinquency.

The attorney general of the United States called a National Conference for the Prevention and Control of Juvenile Delinquency in Washington in Nov. 1946. About 800 representatives of voluntary and official agencies working in this field met in a working conference aimed to stimulate local communities to improve and intensify their work against the causes of delinquency. The reports of the 16 panels on various phases of prevention were designed to be specific guides to agencies and communities in planning a harder attack.

The developing state and local commissions—voluntary and public—on the problems of children and youth worked to channel into constructive efforts the public interest expressed in preventing delinquency. One way these planning groups could help was to evaluate the proposed local methods of prevention and treatment so that energy, time and funds would not be wasted on unsound plans such as punishing rather than helping parents of delinquent children.

Day Care of Working Mothers' Children.—The day care of children expanded greatly during 1937–46 and acquired new users and new sponsorship. The long-established, progressive voluntary day nurseries were unprepared for the wartime demand for their services but formed the pattern for good war centres. Though the majority of mothers made their own arrangements for their children, great numbers could not find places even though they could afford the cost.

The bureau of the census in Feb. 1944 gathered additional data on the employment, marital status and children of women workers. The resulting estimates indicated that

of 16,630,000 women in the labour force, some 2,770,000 had children under 14 years of age. Among women workers in the age groups 25 to 34 and 35 to 44 years, one in every three or four had at least one child under 14. The total number of children under 14 whose mothers were in the labour force was estimated at 4,460,000. Especially serious was the problem of some 750,000 children under 14 whose mothers were employed and whose fathers were away from home. Though the War Manpower commission stated in Jan. 1943 that women with young children should not be recruited until all other sources of labour had been used, many young mothers were sought out by industry because of their skills and work experience.

In most child-care programs, emphasis was placed on the care of preschool children over two years of age and on suitable recreation programs for older children after school hours. If qualified staffs were available, day care included the activities of a nursery school. The best programs gave case-work services, including consultation with mothers before they placed their children and afterward, if problems arose.

Early in 1941 it became clear that federal funds would be necessary to assist the overburdened mushroomed communities. The nursery-school program of the Work Projects administration received funds to reorganize and expand, and gave day-care service until WPA's end in Dec. 1942.

Meanwhile, in June 1941, the Community Facilities act ("Lanham" act) was passed which made federal funds, allotted by the Federal Works agency, available to defense areas for construction, maintenance and operation of group day-care centres, in addition to other facilities. These grants to local school districts and, in fewer instances, to local public welfare departments were made on the basis of war-created need. Applications for funds were certified by the office of education or the children's bureau.

In Aug. 1942 the president granted \$400,000 from his emergency fund to be made available through the Office of Defense Health and Welfare Services (later the Office of Community War Services, Federal Security agency). This money was granted to the states on the basis of plans for day-care services submitted for approval by state departments of welfare to the children's bureau and by state departments of education to the U.S. office of education. The funds were exhausted by the end of June 1943.

The Federal Works agency was the chief source of funds after June 1943. At the height of the child-care program, July 1944, the program thus financed was serving nearly 130,000 children in more than 3,100 centres. By July 1945, the enrolment had dropped to about 102,000 in nearly 2,800 centres. On Feb. 28, 1946, when federal assistance stopped, the number of centres, or units, was 1,479. These were located in 386 communities, in all but 2 states.

With the announcement in Aug. 1945 that federal support of the centres would be withdrawn in October, many communities tried to find local support and were allowed until March 1 to make their arrangements. Many cities and towns were successful; more than three-fourths of the centres continued to function.

Research.—The White House Conference on Children in a Democracy, the fourth of a series beginning in 1909, met in Jan. 1940 and issued a wealth of factual material on the life and growth of the United States in relation to its children. The reports discussed economic factors affecting the well-being of children, and the various services, public and voluntary, that the people had built up for bettering the lives of children.

During the decade 1937-46, studies were made in child

welfare by national voluntary agencies and, among federal agencies, especially by the U.S. children's bureau, which had been charged by congress to investigate and report on all matters pertaining to the welfare of children. The bureau's research fell into its three main fields of activities, maternal and child health, social service and child labour. When war came, appropriations for research and administration were reduced. Long-time research projects were wound up or suspended, and only brief surveys were made in planning wartime services. A few of the research projects of 1937–46 illustrate the aspects of child life studied.

In child health, studies were made on the care of premature infants, yielding important new information on their physiology, circulatory and respiratory difficulties, feeding, and growth, development and health. Other studies were on factors affecting neonatal mortality, including studies on the birth weight of infants; osseous development of infants; physical fitness of school children; rickets and scurvy in children who died from various diseases; and on mortality from accidents—the first of a series of statistical studies on childhood death from various causes.

Federal agencies sponsoring or administering programs for school children studied measures to meet school health needs. The children's bureau, office of education and public health service issued a statement on the health needs of school-age children and recommendations for its implementation.

The American Academy of Pediatrics invited the children's bureau and the public health service to join it in a study to determine the personnel and facilities necessary to make available to all mothers and children preventive, diagnostic and curative medical services, adequate in amount and quality.

When the bureau of the census issued data on births and deaths in 1943, the children's bureau could compare infant and maternal mortality rates over a 10-year period for the United States as a whole because in 1933 satisfactory data were available for every state for the first time. The study showed that from 1933 to 1943 the birth rate increased 30%. For 1933, 2,081,232 live births were registered—a birth rate of 16.6 per 1,000 estimated population. For 1943, 2,934,860 live births were registered—a birth rate of 21.5 per 1,000 estimated population, including the armed forces overseas, the highest rate in almost two decades.

The reduction of maternal mortality was dramatic. In 1933, 12,885 women died from causes directly resulting from pregnancy and childbirth; in 1943, this number had dropped to 7,197. The risk of dying from these causes was actually reduced more than was indicated by the difference between these figures, because there were more than 800,000 more live births in 1943 than in 1933. The number of puerperal deaths per 10,000 live births declined from 62 in 1933 to 25 in 1943—a reduction of 60%.

In 1933, a total of 120,887 infants died before their first birthday. In 1943, the number dropped to 118,484 in spite of the increased number of infants born in the later year. The infant mortality rate dropped from 58.1 to 40.4 per 1,000 live births—a percentage change of 30.5.

The birth rate declined from 21.5 per 1,000 estimated population in 1943 to 20.2 in 1944. The maternal mortality rate declined from 24.5 per 10,000 live births in 1943 to 22.8 in 1944; the infant mortality rate declined from 40.4 per 1,000 live births in 1943 to 39.8 in 1944.

Research in social services for children included a demonstration in St. Paul, Minn., carried on from 1937 to 1943 to develop experience in the early identification of behaviour problems of children and in the co-ordination of

services for children, applicable in any urban area. The project gave services, stimulated and took part in activities, and stressed the correlation of health, education, law enforcement, recreation and case-work services.

In 1945, congress appropriated funds to the children's bureau for a study of the legal guardianship of children, which was in full swing during 1946. The bureau also studied changes during 1933–43 in the volume of foster care of children given by public and voluntary agencies. The most telling quantitative changes were increases in the number of children cared for by public as compared with voluntary agencies and cared for in foster family homes as compared with institutions.

Advisory Services.—Advisory service was given in all fields of children's bureau work on the basis of its research and to the states in the administration of its grants. A mental health unit was added to the staff in 1944 with the aim, in general, of furthering the integration of mental-health concepts in all social and health services for children, and promoting the development of child-guidance and other mental-health services. A consultant on dental services joined the staff in 1945.

Services for children in minority groups included the reorganization of the department of pediatrics of a medical school for Negroes and the development of child-health services in a large community centre for Negroes. In social service, the bureau gave intensive consultation to cities in the west on the integration into community life of the children in Negro families recruited from the south for war work, in addition to its regular advisory services on the problems of Negro children.

Standards.—Much of the bureau's effort was devoted to developing standards based on previous research. Its publication, A Maternity Policy for Industry, was widely used during the war. The bureau and the public health service prepared standard plans for maternity wards and nurseries for new-born infants in hospital construction. Standards and Recommendations for Hospital Care of Maternity Patients was published in 1946.

In the field of social service, the bureau worked on standards for state adoption laws that would protect the child, the natural parents and the adoptive parents. Criteria for detention care were drawn up in 1946. A demonstration program for the prevention of juvenile delinquency, sponsored jointly by the bureau of public assistance, the children's bureau, and the state department of welfare was held during the war in a congested shipbuilding city. It was a test of what could be accomplished by a co-ordination of agencies, none of which was responsible for this type of work.

Child Labour.—The volume of child labour in the United States rose from a very low point to the highest the country had known for three decades. Progress was made, at the same time, in both federal and state legislation. In 1937 there was no federal regulation of child labour. Two laws passed previously by congress to control child labour directly and a third indirectly, had been declared unconstitutional by the United States supreme court, the third as late as 1935. In 1938, however, congress passed the Fair Labor Standards act which in 1941 the supreme court unanimously sustained as constitutional.

The child-labour provisions of the act set a basic 16-year minimum age for employment of children in establishments producing goods for interstate and foreign commerce. Exceptions permitted children of 14 and 15 to be employed in nonmining and nonmanufacturing occupa-

tions by their parents or under conditions that did not interfere with their health, schooling or well-being.

The act further provided that boys and girls under 18 might not be employed in any occupations declared and specified by the act to be particularly hazardous or detrimental to their health or well-being. An order issued after determination of a special hazard, had the effect of setting an 18-year minimum age for the occupation covered. Before the war, six orders were issued, relating to occupations in the manufacture of explosives, driving or helping on motor vehicles, occupations in coal mining, in logging and sawmilling, and in the operation of power-driven woodworking machines, and occupations involving exposure to radio-active substances. The seventh order was issued in July 1946, effective in September, relating to occupations involved in the operation of power-driven hoisting apparatus.

The child-labour provisions of the Fair Labor Standards act were originally administered by the children's bureau of the U.S. department of labour. On July 16, 1946, however, under the president's Reorganization Plan No. 2, the bureau, with the exception of its industrial division, was transferred to the Federal Security agency. This division remained in the department of labour as the child labour and youth employment branch of the division of labour standards, continuing to administer the child-labour provisions of the act. Certain duties of the chief of the bureau under the act were transferred to the secretary of labour.

From 1930 until the outbreak of World War II, the figures available indicated a continuing decrease in the employment of children in the United States, caused in part by unemployment and in part by restrictive legislation and a tendency to lengthen the period of schooling. The war years radically changed the picture of child labour and youth employment. The 1940 census showed fewer than 1,000,000 young persons 14 through 17 years of age at work. The number of workers rose to the neighbourhood of 3,000,000 in some school months during the war period. Of these, about half had left school and were working full time; about half were working and attending school as well. In the summer peak of each of the 3 years, the number of employed youth rose to between 4,500,000 and 5,000,000. In addition, many thousands of children under 14, for whom no official count existed, were employed either full time or part time during the war.

A decrease in the number of minors 14 through 17 years of age at work took place in the period after V-J day, although not to the degree that many had anticipated, especially in the first few months. As late as Nov. 1945, unpublished estimates by the bureau of the census showed that approximately 2,500,000 boys and girls of these ages were working either full time or part time. Data from other sources indicated that in the early summer of 1946 the employment of young workers was continuing to decrease in comparison with the wartime years. It was still much higher, however, than at the time of the 1940 census.

During the war, the increase in child labour reversed the upward trend in high-school enrolment. The number of students enrolled in the school year 1940–41, according to the U.S. office of education, had reached a total of 7,224,000, or 75% of the boys and girls of high-school age. This was an increase of nearly 5,000,000 since 1920, when only 32% were enrolled. By the school year 1944–45, approximately 1,250,000 fewer boys and girls were enrolled in high school than in 1940-41. The downward trend apparently was checked before V-J day, and in 1945–46,

enrolments again began to climb slowly; but far too many boys and girls were still at work instead of in school.

Efforts to uphold standards in the employment of youth under 18 years of age not customarily used as a source of labour were embodied in statements of policy on the part of the federal agencies responsible for the protection of youth from harmful employment and from the curtailment of their education, and agencies responsible for the effective distribution of the nation's manpower. Three statements of principle were issued, the first in March 1942 on the recruitment of young workers for wartime agriculture; the second in Jan. 1943, issued by the War Manpower commission; and the third in Sept. 1943 on the nonagricultural employment of youth under 18 still in school. The principles were that the employment of young people should be developed with full regard to laws on child labour and school attendance, to sound educational policies and to safeguards to health and well-being. Later the war and navy departments and army air forces established standards for their young civilian employees that were substantially in accord with these policies.

At the peak of the depression of the 1930s, many children were on the move with their families who were searching for work in industrialized agriculture—the children earners themselves when work was found. But even this large number of migrant farm families increased when World War II came, and through 1946. Very often this work was as unsuitable for children as factory work, from which they had been generally safeguarded.

Child farm workers were given little protection by federal or state laws. Two federal laws enacted during 1937-46 protected them to a limited extent only—the Sugar act of 1937 and the Fair Labor Standards act of 1938. The basic minimum age established by the latter act applied only on the days and during the hours when children were required to attend school, by widely varying state school-attendance laws.

Thousands of local children also worked on hand crops at seasonal peaks, but most of them were older children and were working when schools were closed. Many city children worked on farms during summer vacations. Voluntary standards issued for their working and living conditions and safety in transportation were observed well in some places, badly in others and ignored in many.

Other American Republics

The activities on behalf of children in the other American republics were noticeably restricted as a consequence of World War II. Nevertheless, the progressive trends which had begun before 1937 continued during the decade. One of these trends was toward securing greater effectiveness in the child-welfare services in the individual countries by co-ordinating them in each country under a single government agency of national scope. Such agencies were established and put into operation during the decade in Argentina, Brazil, Chile, Mexico, Peru and Venezuela.

In Argentina, the Bureau of Maternal and Child Welfare began to function in the national department of health in 1937. The authority of the bureau extended to the city of Buenos Aires, the federal territories and to those provinces with which the bureau had made agreements for co-operation.

The bureau maintained health centres and dental clinics for mothers and children in Buenos Aires and other parts of the country. It also operated a mobile-dental clinic which visited kindergartens and children's institutions and gave free examinations and treatment to children. The bureau made studies of the birth rate, infant mortality rate, and of the living conditions of preschool children. Much attention was given to the needs of rural localities.

Health education was conducted by the bureau over the radio and through specially prepared motion pictures, posters and leaflets. Social workers were employed to visit the mothers and advise them in the proper care of their children and homes.

In Brazil, several efforts to organize a national public agency were followed by the creation of the national children's bureau in 1940. The bureau was assigned the duties of stimulating and directing the organization of health and social services for mothers and children. It organized many "Maternal and Child Welfare Associations" of groups of private citizens; with money collected among private persons and with subsidies from the bureau, these associations set up prenatal clinics, child-health centres and other facilities. Their work was under the control of the children's bureau. In 1945, there were 1,000 such associations in Brazil.

The bureau distributed federal appropriations for the construction and maintenance of maternity homes, prenatal clinics, child-health centres, day nurseries and other health services. It maintained training courses for the physicians and other persons on its staff. Standards were published for various health services for mothers and children.

In Chile, the National Bureau for the Welfare of Children and Youth was organized in 1942 to supervise the work of prenatal clinics, maternity homes, health centres for the examination of well children, dental and other special clinics, children's hospitals and institutions for dependent and problem children, etc. Some of these facilities were established by the national bureau itself; for example, several dental clinics for expectant mothers and for children, and clinics for the treatment of tuberculosis and diseases of the heart, skin, eye, ear, nose and throat in children. Public-health nurses and social workers were employed by the bureau to visit the mothers at home.

In Mexico, after several attempts at co-ordination, the Bureau of Child Health and Welfare was set up in 1944. It undertook supervision of the work of prenatal clinics, maternity homes, child-health centres, day-care centres and others. Some of these facilities were established by the bureau; all received their total or partial support from government appropriations.

Expectant mothers and all children received free medical examinations, bacteriological tests and in some cases medical and dental treatment. Special attention was given to the detection of syphilis and tuberculosis. Immunization work was done, and instruction in child care was given to mothers. A mental hygiene clinic, mobile medical-dental clinic, maternity hospital and several day-care centres were established by the bureau. Public-health nurses and social workers were employed by many of the services. Committees of volunteers helped the bureau by collecting funds for the establishment and maintenance of health services for children.

The bureau also had general supervision over the numerous mothers' clubs which provided for their members instruction in simple trades, in the care of their health and in home management. Other work included publication of material for use by physicians and other persons engaged in work for mothers and children; issuance of regulations for subordinate agencies; drafting of laws for the regulation of health services; and planning for improvement in the situation of dependent and neglected children.

In Peru, the centralized Bureau for the Protection of Mothers and Children was created at the end of 1945. This bureau was active in the prevention of diseases of childhood, and it provided childbirth attendance by trained midwives, economic aid to mothers and medical care to mothers and to children. It also conducted education in child care. All this work was done by the bureau through prenatal clinics, lunch rooms for mothers, stationary and mobile child-health centres and clinics for children, day nurseries and vacation camps for children. The bureau also maintained a nutrition clinic, a child-guidance clinic and a school for mothers. Social services were available. Most of these facilities, however, were concentrated in a few larger cities.

In Venezuela, the Bureau of Maternal and Child Health, organized in 1936-37, became in 1942 the Bureau of Health for Mothers, Young Children and School Children. Laying stress on the needs of the rural population, the bureau announced as its chief task the reduction of maternal and infant mortality. It established prenatal clinics, children's clinics at which preventive and curative treatment was given, day nurseries and kindergartens. Midwives were employed to attend women unable to pay the cost of the service. Public-health nurses visited women in their homes and instructed them in health measures.

Outside the capital, health work for the general population was done by public-health units. These units sent out midwives to attend women at childbirth in their homes and give preventive and curative treatment to expectant mothers and to children.

In several other countries a similar approach was made toward centralizing the services for mothers and children, but with limited results. In Bolivia, the Board of Child Welfare was created by a decree of 1937 for the supervision of public and private welfare work and for related tasks. In Colombia, the Bureau of Maternal and Child Welfare was established in 1939 for directing health and social work for mothers and children. In the Dominican Republic, the National Board of Maternal and Child Welfare was created in 1940.

In Uruguay, where child health and social services were co-ordinated in 1934 in the Council of The Child, effective work was continued during the decade 1937–46. The council had charge of all matters relating to prenatal and maternity care for women of small means and to health and social welfare of children from low-income families. It supported and controlled prenatal clinics, clinics for children, day nurseries, institutions for children and other facilities. In 1935, it introduced financial aid to mothers as a means of preventing separation of mother and child, also a system of supervised foster-home care for children under 14.

School Attendance and Employment.—School attendance had been required by law for many years in almost all American republics. In some of these countries the laws were amended in the course of the decade 1937–46: in Ecuador in 1938; Guatemala, 1937; Haiti, 1942; Mexico and Panamá, 1941; Peru, 1941 and 1943; Venezuela, 1940.

The school-attendance laws required the parents to send their children to school usually at the age of six or seven years, and for a definite period of time, varying in the different countries from four to seven years. In some countries a child was exempt from school attendance if there was no school within a specified distance. Some of the new laws, for example, those of Guatemala, Mexico, Panamá and Peru prescribed a census of children of school

age and imposed penalties on parents failing to send their children to school. But despite these efforts many children were reported to be left out of school. This was often attributed to the lack of schools and the poverty of the people.

The school children's health received increased attention during the decade. In some countries physical examinations were given to school entrants and periodically to all children in primary schools in the larger cities. Stress was laid on the checking of tuberculosis and other communicable diseases; free treatment was given for some diseases.

Dental services, mostly free of charge, were introduced during the decade, in some of the cities of Argentina, Colombia, Costa Rica, Cuba, the Dominican Republic, Ecuador, Mexico, Peru and other countries.

School lunches and vacation camps for children from low-income families also became part of the school health services; they were maintained either by public agencies or by private organizations.

Child labour in a number of the Latin American countries had been regulated by law prior to 1937. After that date Argentina, Brazil, Costa Rica, Ecuador, Panamá and Venezuela amended their previous legislation, and Bolivia and Nicaragua enacted laws for the first time.

The minimum age for entering full-time employment in these countries was 12 or 14 years, with some exemptions. The working hours allowed by law for children under 18 varied from 5 to 8. Night work was prohibited, also hazardous and physically or morally harmful work. Work cards were required in some countries.

Juvenile Courts.—In addition to the laws on juvenile courts which existed in several Latin American republics prior to 1937, such laws were enacted in the Dominican Republic in 1941; Ecuador, 1938; Guatemala, 1937; and Venezuela, 1939. In Argentina, where a law of 1919 applied only to Buenos Aires and the federal territories, juvenile courts were established after 1937 in several provinces, among them Buenos Aires, Mendoza and Santa Fe. In Mexico, previous legislation was amended and codified in, 1941.

Social Insurance.—A steady expansion of social insurance, including health and maternity insurance, took place. During the decade, laws on this subject were enacted in Costa Rica, Guatemala, Mexico, Panamá, Paraguay, Peru and Venezuela. Medical care for dependents, in addition to that for the insured persons, was authorized by these laws.

The social-insurance organizations in some countries attached great importance to the protection of mothers and children in the insured groups. This was particularly true of Chile, where a Division of the Mother and Child had been operating within the insurance system since 1937. Under the auspices of this division, expectant mothers were examined by physicians and nurses, attendance at child-birth was provided and children were kept under regular medical supervision until the age of two years. Special attention was given to the treatment of congenital syphilis and tuberculosis.

Also in connection with social insurance, a law was passed in Chile in 1938 requiring annual examinations of all insured persons, including young workers, for the purpose of early discovery of illness and prevention of disability. A somewhat similar law was passed in Argentina in 1944.

Maternity insurance, which, as a rule, remained a part

of health insurance, was introduced without such insurance in Argentina and Cuba in 1934, but began to operate in 1937. The laws of both countries were amended in 1942. Under these laws, maternity insurance was made compulsory for women of childbearing age employed in most occupations, and in Cuba also for employed men, who were required to insure their wives. In Cuba, every woman insured in her own right received full wages for six weeks after confinement; her employment during that time was prohibited by law. She was also attended at childbirth by a physician or midwifé. The wife of an insured man received a cash benefit or hospital care at childbirth.

The law of Argentina was in general similar to that of Cuba.

Inter-American Activities.—The years 1937–46 witnessed the development of inter-American co-operation in the field of child welfare. An important factor in this work was the American International Institute for the Protection of Childhood. This institute was founded in Montevideo, Uruguay, in 1927, to serve as a centre of study, information and advice on all matters pertaining to the welfare of children in the Americas.

The membership of the institute gradually increased to 18 of the 21 American republics, among them the United States. Each member country was required to pay annual dues

The activities of the institute were governed by an international council of representatives of the member countries and by a director, assisted by an office staff. In 1944 the council decided in favour of setting up in the institute departments of child health, education and labour, for the purpose of guiding the work done along these lines in the American republics. In 1944–45 the institute made a study, by means of questionnaires, of rheumatic fever and rheumatic heart disease in children in the American countries. It continued the publication of its quarterly bulletin on child-welfare developments, and in 1942 began to publish a news summary several times a year.

Plans were made for expanding the work of the institute and for securing closer co-ordination with the work of the Pan American Child congresses.1 Other meetings of representatives of the American republics were held for the promotion of joint welfare interests. In spite of wartime difficulties, the First Inter-American Conference on Social Security met in Santiago, Chile, in 1942, and recommended, among other subjects, the establishment of welfare services for mothers and children within the framework of social insurance. The First Inter-American Congress on Social Service, held in Santiago, Chile in 1945. discussed social services for children. The Inter-American Conference on Problems of War and Peace held in Mexico City in 1945 recommended that all the American repullics give full support to the American International Institute for the Protection of Childhood and to other inter-American organizations working for social welfare.

Inter-American co-operation also gained official approval from the United States government. In 1939 the congress authorized participation by the United States in co-operative public health and welfare work in the American republics and it later made grants for that purpose.

As part of this program of co-operation, the United States children's bureau furnished consultation services, on request of the respective governments, to official agencies concerned with health and welfare of children in Bolivia, Brazil, Chile, Colombia, Costa Rica, the Domini-

The following Pan American Child congresses were held: Buenos Aires, Argentina, 1916; Rio de Janeiro, Brazil, 1919; Montevideo, Uruguay, 1922; Santuago, Chile, 1924; Havana, Cuba, 1927; Lima, Peru, 1930; Mexico City, Mexico, 1935; and Washington, D.C., 1942.

can Republic, Ecuador, Guatemala, Mexico, Paraguay, Peru and Uruguay. For this purpose professional workers were sent to the above countries. Training grants were given to students from other American republics for professional study and observation in schools of social work and other institutions in the United States. (See also Birth Statistics; Census Data, U.S.; Children in World War II; Crime; Federal Bureau of Investigation; Infant Mortality; Marriage and Divorce; Social Security.)

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Chile

Chile, a republic fronting on the south Pacific coast of South America for about 2,600 mi., has an average width of only 110 mi. The area had never been accurately measured, but the official estimate was 290,085 sq.mi.; figures cited with good authority in other sources were 286,-322 and 286,396 sq.mi. Pop. (official est., Jan. 1, 1944), 5,237,432. Population by the 1940 census was 5,023,539; the official estimate in 1943 was 5,229,367. The population is predominantly white, with some mingling of Indian strains gradually becoming obliterated; the mestizo element in 1946 formed no more than 15% of the total, and Indians comprised about 5%. Capital and principal city: Santiago (pop., including suburbs, 1940 census, 943,669). Other important cities, with 1940 census pop.: Valparaíso, the chief port (212,072), Concepción (85,938), Viña del Mar, a popular seaside resort (1940 est. 70,013), Talca (45,-462), Antofagasta (50,244), Chillán (39,909), Temuco (39,-217), Iquique (37,713), Talcahuano (30,082), Valdivia (34,-600), Lota (31,087), Rancagua (21,621), Punta Arenas (29,-784), Osorno (25,075), La Serena (21,383), Puerto Montt (21,552), Curicó (19,532), Los Angeles (commune 52,259) and San Bernardo (commune 30,345).

The constitution of 1925 established a unitary government headed by a president elected by direct, popular vote for a six-year term and ineligible to succeed himself immediately; the congress to include a senate of 45 members, and a chamber of deputies of 147 members elected on a population basis. Presidents during the decade 1937–46: Arturo Alessandri y Palma (1932–Dec. 24, 1938); Pedro Aguirre Cerda (Dec. 24, 1938–Nov. 25, 1941); Jerónimo Méndez (Nov. 25, 1941–April 2, 1942); Juan Antonio Ríos Morales (April 2, 1942–June 27, 1946); Alfredo Duhalde (became acting president, Jan. 17, 1946), (June 27, 1946–Aug. 3, 1946); Vice-Adm. Vicente Bielich, beginning with the latter date.

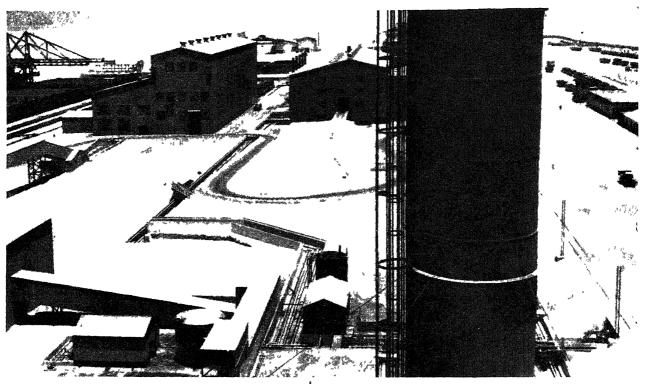
Political Ferment.-The year 1937 opened with a highly

confused political situation. President Arturo Alessandri, who during his first term as president (1920-25) had been a spokesman of liberal elements, had become increasingly conservative. In 1936 he had attempted to detach the Radical party (Chile's strongest single political group) from the newly organized Popular Front—the first genuine popular front movement in any Latin-American statewith an offer of three cabinet posts, but the party refused unless other leftist parties were also given recognition. This refusal, coupled with conflicts between Socialist and nazi groups and with demands for the resignation of the finance minister, led Alessandri late in the year to ask for dictatorial powers on the pretext of suppressing communism: Conservatives and Liberals (the latter also a conservative group) supported the president in the congress and provided a majority of the cabinet. The Popular Front formed the opposition, although some Radicals favoured co-operation with the president. The congressional elections of March 8, 1937, were held without serious disorder, and resulted in a general victory for the government parties, although three nazis and seven Communists won seats.

Political tranquillity did not follow the elections, as was hoped. Gustavo Ross, foreign minister and minister of finance and an outstanding leader of the rightist groups, resigned his posts two days after the elections, ostensibly because of Alessandri's refusal to force resignations of leftist cabinet members, but also because of growing popular resentment against him because of increasing food prices, for which he was held responsible. Ross, one of the wealthiest men in Chile, had been supervisor of Chilean finances for four years, during which time he had balanced the budget and accomplished other reforms, but his policy of encouraging exports to the United States led him to be accused of favouring the agriculturists and capitalists and sacrificing the interests of labour. The government adopted various measures to lower prices in the face of a serious food shortage.

Increased activity by Chilean nazis (Nacistas) became of serious concern to the government by May 1937. When tear gas bombs were thrown at Alessandri on May 21, many nazis were arrested in consequence; frequent clashes with police occurred thereafter during the year. The minister of the interior, in order to meet the nazi threat, banned all mass meetings and the wearing of uniforms and insignia indicating group affiliation.

In the field of foreign affairs, Chile negotiated an important treaty with Bolivia in Aug. 1937, after months of conferences between economic experts of both countries. The treaty provided for a Bolivian customs house at Arica in northern Chile and unrestricted Bolivian importation through Chilean territory, a most-favoured-nation provision plus agreement for the establishment of permanent trade commissions for the two countries and elaborate plans for stimulation of cultural exchanges. Considerable alarm was aroused in Chile in June by publication of an article in the newspaper Aurora which charged that Argentina was ambitious to seize Chilean territory; the assertion was based on Argentine activities in the far south, in the vicinity of Tierra del Fuego and Magallanes, and referred to increased Argentine military preparations, colonization efforts in Patagonia, military manoeuvres near the Chilean frontier and the visit of Argentine livestock experts to frontier districts. Foreign observers speculated that the article might have been inspired by the government's desire to win popular support for its program for develop-



ment of the army, navy and air force. Chilean concern over the growing obsolescence of its navy had been aroused earlier by the visit of the Argentine fleet in May; following the *Aurora* article, the government exerted itself to improve the national defense, especially by making a heavy outlay for rapid naval improvement and for the purchase of military aeroplanes.

The year 1938 was dominated by the presidential campaign and election. Chilean parties fell into two groups, roughly the Right and Left, the latter commonly referred to as the Popular Front. Alessandri threw his support to Gustavo Ross; the choice of the Popular Front was Pedro Aguirre Cerda, a millionaire landowner but a political moderate. Col. Marmaduque Grove, a former provisional president and a fiery Socialist leader, had been the original Popular Front choice. The Nacistas, led by a young man of part German ancestry, Jorge González von Marées, proved embarrassing to the government from the beginning of the year. González von Marées, a deputy, created a sensation at the opening of the congress in May by firing a pistol shot during Alessandri's address; a bomb was exploded in the congressional gardens. González was arrested, but released. A more sensational climax came Sept. 5, when several score Nacistas seized a large public building and were subdued only after 4 hours of vigorous fighting, leaving 62 dead. Alessandri and Ross had both apparently been marked for assassination. The president was given extraordinary powers, which were lifted in part for the closing days of the campaign. González von Marées and other Nacista leaders, and former President Carlos Ibáñez, who was closely associated with the Nacistas, were arrested. González was sentenced to 20 years' imprisonment, but Ibáñez was released just before the election and

Aguirre's Administration.—The election campaign progressed with high feeling. More than most Latin-American elections, it was a contest between liberalism and conservatism. Most political observers picked Ross, who had strong government support, to win, but the final vote favoured

Chilean nitrate mill, where the nation's second largest item of export is manufactured. Disposition of artificial nitrate plants built in the U.S. to supply wartime needs for fertilizer and explosives became a matter of critical interest in the postwar economy of Chile

Aguirre with a margin of 4,111 out of 443,525 votes cast. Ross asked for a recount but later conceded the election and left for a trip abroad. Aguirre Cerda was inaugurated Dec. 24. His first official act was to pardon González von Marées, presumably for the support that the Nacistas had thrown to the Popular Front ticket late in the campaign. Ibáñez returned to Santiago Dec. 31 and was welcomed by uniformed Nacistas.

Throughout 1939, the Aguirre Cerda administration faced opposition to its legislative program even from some of the component parties of the Popular Front as well as from conservative elements. Santiago retail bakers demonstrated on Jan. 13 against the government cut in bread prices. Government victories in by-elections the same month demonstrated popular support for its program, however. Army officers were in April forbidden to join or support political groups. The Popular Socialist Vanguard (the renovated Nacistas or Chilean nazis) and a new fusion party under Ibáñez announced support of the government in April. In May 1939, the government revealed an alleged plot to overthrow it through a boycott; in Aug. occurred an unsuccessful coup led by Gen. Ariosto Herrera and Carlos Ibáñez, who had been considered a government adherent. Political feeling continued to run high throughout the year, and when former President Alessandri, an opponent of Aguirre Cerda, returned in Dec. from an absence of some months in Europe he was threatened by a mob in Antofagasta. The government's constructive program was seriously interrupted by the disastrous earthquake of Jan. 24, 1939, and by domestic political opposition, so that the greatest specific achievements were in improved housing.

An important dispute arose between Chile and Spain early in 1939 over the right of asylum in the Chilean legation in Madrid, a right the Franco government sought to deny with regard to Spanish Republicans who had taken refuge there; Spain tacitly conceded the Chilean contention in Oct., however.

Chile promptly declared its neutrality in World War II and participated in the first inter-American foreign ministers' conference at Panamá in Sept.—Oct.

Anti-Communist feeling increased during 1940, and the chamber of deputies in Nov. approved legislation outlawing the party; Socialist party leaders strongly attacked the Communists the following month. Minister of Development Oscar Schnake, who had just returned from several months in the United States, and Marmaduque Grove, both prominent Socialist leaders, urged a Pan-American front against all totalitarian ideologies. Aguirre congratulated Schnake, but other leaders defended the Communists as loyal members of the Popular Front. Fifth column activities received wide attention, both in Chile and abroad, and it was charged that from \$50,000 to \$100,000 monthly was being spent on nazi propaganda. Many Chileans were alarmed over German land ownership along the border in southern Chile, but the Socialist party protested a government decree of Aug. 17 empowering the police to deal with "professional agitators." The Popular Vanguard and other agitator groups were especially active late in 1940.

On July 17, 1940, just before the opening of the second inter-American foreign ministers' conference at Havana, Spain suddenly broke diplomatic relations with Chile. Brazil handled Chilean interests in Spain until, on Oct. 12, the latter government made a unilateral announcement of resumption of relations. Chile rejected German protests against continued Chilean recognition of Polish, Danish and Norwegian representatives at Santiago.

Chile generally remained rigorously neutral and at the Havana conference condemned the proposal for "provisional administration" over European possessions in the new world as "premature." Relations with the United States were generally quite friendly, however. The Chilean senate on May 15 passed a resolution condemning invasion of neutral countries.

The political scene was marked by uncertainties throughout 1941. The Popular Front appeared on the verge of collapse with the formal secession of the Socialists on Jan. 7 after a bitter feud with the Communists. Disregarding possible political effects, Aguirre vetoed a bill passed by the rightist-controlled congress outlawing the Communist party. In the congressional elections on March 2, the reorganized Popular Front won 71 of 147 lower house seats and 19 of 45 senate seats, while rightist parties captured 61 and 21 seats respectively. Socialists, with 15 deputies and 5 senators, thus held the balance of power. Communists gained considerably, electing 17 deputies and 4 senators. The Popular Socialist Vanguard (former Nacistas) elected only two, including González von Marées. An organized Vanguardist mob attacked the Radical party convention in May, two days before the congress opened, and killed one delegate. The government arrested 42 Vanguardists and attempted unsuccessfully to put González in an insane asylum. Attempts in the new congress to expel its Communists failed by close votes, 71 to 66 in the chamber and 20 to 16 in the senate. After Russian entrance into World War II, the Communist-Socialist feud was patched up. The congress was especially interested in national defense and appropriated 4,000,-000,000 pesos (approx. \$135,000,000) for it.

Frequent cabinet changes occurred in 1941. After several months of bitter dispute with his own Radical party, Interior Minister Arturo Olavarría, advocate of rigid neutrality, resigned and was succeeded by Dr.

Leónidas Guzmán, honorary president of the anti-nazi and anti-fascist league. When President Aguirre became seriously ill in Nov., Dr. Jerónimo Méndez, little-known president of the Radical party, was named interior minister, and when Aguirre temporarily withdrew he became acting president. President Aguirre died Nov. 25, after which Méndez set new presidential elections for Feb. 2, 1942.

Nazi propaganda and other activities were strong late in 1941. When the Vanguardists failed to attract popular support, Germany, as a good will gesture, presented to Chile the German training ship "Priwall," which had been immobilized at Valparaíso from 1939. Rumours of a nazi-inspired putsch were common in 1941, especially after discovery of secret arms caches in southern Chile, where thousands of Germans lived. Many arrests followed, and investigation disclosed existence of semimilitary organizations said to include up to 200,000 members, chiefly of German extraction, at least 10,000 regular financial contributors and liaison with Argentine nazi plotting. Chilean neutrality policy continued, but the government co-operated, usually on an independent basis, with hemisphere defense plans. The government on Feb. 16 (even before U.S. action) took over three interned Danish ships (and later, two more) because of the acute shipping shortage. Five German ships, in Chilean ports from 1939, were allowed to escape, however. The government in June banned all outdoor public meetings and parades in favour of any belligerent state and on Aug. 9 forbade all radio propaganda.

During 1941 Chile concluded trade treaties with Mexico, Brazil and Colombia and nonaggression pacts with Bolivia and Peru. Chile acted as arbiter in a Costa Rica-Panamá boundary dispute, and began formal diplomatic relations with Canada. In Dec., Chile accorded the United States nonbelligerent rights and belatedly ratified the Havana pacts of July 1940. Chile also began negotiations with Argentina for modification of their treaty of 1881, demilitarizing the Strait of Magellan.

Ríos President.—Juan Antonio Ríos, Radical party candidate, won an easy victory in the elections on Feb. 1, 1942; Ibáñez was second in the balloting. Ríos was inaugurated April 1 for a six-year term. Despite the role of Foreign Minister Juan B. Rossetti in initiating the third foreign ministers' conference at Rio in Jan. 1942, Chile did not immediately break off relations with the axis powers as the Rio conference recommended. The government, in effect, marked time on foreign policy until Ríos' inauguration. Argentina and Chile, the only two American states not acting affirmatively on the Rio recommendations, tended to draw closer together in foreign policy.

Ríos did not immediately change the neutrality policy, but congressional debates on it became intense. Socialists were especially active anti-noninterventionists; Development Minister Schnake on June 4 asserted to a demonstrating crowd that Chile would not remain neutral. Criticism of government policy increased when it was announced in July that military officials, sent earlier to Washington on a purchasing mission, had been ordered home, presumably because of lack of success. When Ríos in Aug. accepted an official invitation to visit Washington, it was assumed that Chile would move gradually toward a break with the axis. President Ríos declared in Sept., however, that his purpose was to study the needs of hemisphere defense and that Chile would remain free to determine its own foreign policy. The statement seemed intended to placate the

noninterventionists, and Schnake in the same month resigned as minister of development. A great uproar came from the charge made by U.S. Undersecretary of State Sumner Welles in a Boston, Mass., speech on Oct. 8 that two Latin-American countries (unnamed, but unmistakably Chile and Argentina) were used as bases of axis activities. President Ríos immediately cancelled his imminent trip to the United States and instructed the Chilean ambassador to protest the Welles speech. Proaxis elements in Chile tried to stimulate Chilean resentment, but some informed nationals asserted the justness of the Welles charges. The government, on being given supporting evidence, began a campaign against axis spies.

Foreign Minister Barros Jarpa, increasingly regarded as the chief noninterventionist, soon became the centre of attack by the opposition, and attempts were made by mid-Oct. to force his resignation. He reportedly refused to withdraw unless the cabinet resigned en masse, and this step occurred Oct. 20; practically all former ministers were reappointed, however, except Barros Jarpa, who was succeeded by Joaquín Fernández y Fernández, Chilean ambassador to Uruguay. The new government moved more boldly against alien agitators. Interior Minister Morales went to Washington for secret conferences in Dec., thus seemingly forecasting closer Chilean relations with the other American republics.

The long-expected Chilean break with the axis finally came on Jan. 20, 1943, thus leaving Argentina as the only American republic maintaining relations. Chile's new status, and conferences held even before the break in relations, resulted in the signing, on March 2, of a lend-lease agreement with the United States. An important new copper purchase contract was concluded with the U.S. Metal Reserves corporation in June, extending an earlier purchasing agreement through July 1944, with increased prices for Chilean copper. The United States also agreed to purchase reasonable amounts of gold and manganese to assist Chilean economy, and to aid in shipment of machinery and coal needed by Chilean industry.

Despite its abandonment of neutrality, Chile maintained favourable relations with Argentina. The two governments in April signed a ten-year contract by which Argentina purchased substantial quantities of nitrates. Trade agreements signed late in Aug. provided for a great reduction in Argentine-Chilean tariffs and initiated plans for a projected customs union, in which it was hoped that other near-by states might eventually participate. The two governments also discussed plans for improvement of trans-Andean roads, especially for the reopening of the railway through the Uspallata pass, blocked by slides from 1934.

The year 1943 displayed much domestic political factionalism. The Socialist party was badly split early in the year by differences between Marmaduque Grove and Salvador Allende, with the breach not healed until April, when the two became respectively president and vice-president of the party. Chile's 22 parties found hurried realignments necessary in June because of the official dissolution of the Third International, the world Communist organization. The Chilean Communist party now attempted to organize a powerful leftist coalition, including both the Communist and Socialist parties as well as others. Legislative delays resulting from the political manoeuvring led President Ríos in June to form a cabinet of "experts" rather than of party representatives; conditions also caused him again to postpone his projected visit to the United

States. The "ministry of experts" was dissolved in Aug., although six of its members were retained in the new cabinet, which also included two members from the conservative Liberal party. A special congressional session in Oct. considered pressing financial matters, especially the prospective deficit of more than 500,000,000 pesos.

Industrial and port strikes proved troublesome in 1943, and the congress on Nov. 16 finally granted emergency powers to Ríos in the hope that executive action might improve Chilean conditions. By the so-called economic bill on Nov. 29, actually a constitutional amendment, all functions relating to the compilation of the annual budget were placed under the president's supervision and the president was given exclusive power to introduce the budget in the congress.

President Ríos as early as Jan. 14, 1944, began his efforts to keep his cabinet intact by rejecting the resignations of his finance and public lands ministers, both members of the conservative Liberal party. The national convention of the Radical party, of which Ríos was a member, opened its sessions in Concepción on Jan. 20 and began agitation for a cabinet composed entirely of members of leftist parties, which Ríos refused to grant. The Radical demand was strengthened by results of municipal elections on April 2, in which the surprising total of 765,092 votes was cast. The Democratic Alliance, a leftist coalition dominated by the Radical party, carried 805 seats in municipal councils, with especially important victories in Santiago, Valparaíso, and Viña del Mar, to 595 seats won by the rightist Liberal-Conservative coalition. When Ríos still refused to conform to the demand for cabinet reorganization, the Radical party ordered its five members who held cabinet posts to resign from the government; they did so, but when the president on April 26 refused to accept their resignations they decided to remain in the cabinet and the party consequently expelled them from membership. President Ríos declared that if he had to choose between the party and the presidency, he would follow an independent course.

Finance Minister Arturo Matte on Jan. 20 decreed the liquidation of all branches of two large German banks operating in Chile, and also of an allegedly pro-nazi news agency. The government on Feb. 23 began arrests to break up a large German spy ring formed by Maj. Ludwig von Bohlen, a former German embassy attaché. The Chilean activities were linked to current espionage in Argentina but, notwithstanding that, the Chilean government was the first to recognize the revolutionary Argentine government headed by Gen. Edelmiro Farrell, taking the action on March 3. This resulted in much criticism by the Radical party president, Alfredo Rosende, the Chilean Confederation of Labour and other groups and individuals, and contributed to the party crisis of April. Other points of friction in foreign affairs were the leftist demands that the government establish diplomatic relations with the U.S.S.R. and break relations with the Franco government in Spain, both of which Ríos refused to do precipitately. The foreign ministry announced on May 10 that Chile would extend nonbelligerent status to any non-American state which had already declared or later declared war against Germany or Japan. Following the opening of the French front on June 6, 1944, the Chilean senate sent congratulatory telegrams to Roosevelt, Churchill and Stalin. Inclusion of the third of these was considered significant in view of the lack of diplomatic relations between Chile and the soviet union. Negotiations were subsequently undertaken for the establishment of such relations, and the step was completed on Dec. 11.

Former President Arturo Alessandri, aged 75, was elected a Chilean senator in a by-election on Aug. 27, taking his seat Nov. 27. The return of "the lion of Tarapacá" to active politics was a sensation in Chile and was in part responsible for the charge by the Radical party that conservatives were again in control and were endangering Chilean social gains.

Debates in the congress in Feb. 1945 over Chile's war status led President Ríos to assert on Feb. 14 that Chile recognized a state of belligerency with Japan but not with Germany because "that nation is defeated." Ambassador Marcial Mora signed the United Nations pact for Chile at Washington, D.C., on Feb. 14. The senate and the chamber of deputies, on April 5 and 11, respectively, approved a declaration of war, and the president and his cabinet signed it April 11.

Domestic politics continued disturbed during 1945. Congressional elections on March 4 were immediately followed by a collective cabinet resignation which Ríos refused to accept. Later figures showed that rightist groups had won 23 senate seats and leftists 22; in the chamber of deputies the rightists were indicated to have 71 seats divided as follows: 36 Conservatives, 31 Liberals, 1 Progressive Liberal, 3 Agrarians; leftists divided 75 seats as follows: 38 Radicals, 18 Communists, 7 Socialists, 5 Falangists, 7 Democrats; 1 independent was elected. President Ríos later planned to organize a cabinet including Radicals, Liberals, Democrats and Agrarians, but, because of party disagreements, abandoned the plan April 30. A new cabinet sworn in May 14 was composed chiefly of moderate leftists from the Radical, Socialist, Democratic and Chilean Falangist parties. When the congress organized on May 22, Arturo Alessandri was elected president of the senate and Conservative Deputy Juan Antonio Coloma president of the lower house. A cabinet resignation on Sept. 20 allowed President Ríos to select a new ministry before departing for the United States.

Ríos made his twice-postponed visit to the United States in Oct. and was entertained by President Truman Oct. 11. An important purpose of the visit was allegedly to get U.S. commitments concerning the Chilean copper industry. Postwar plans announced in March 1945 involved the spending of some \$56,000,000 for construction, power development, railway equipment and housing; the government in Sept. considered plans for importing prefabricated houses to meet the growing shortage. As a countermeasure to inflation, the government in April sought authority for wide control over salaries, rents, prices and transportation charges.

Rios' Resignation and Death.—Ill health forced President Ríos to withdraw on Jan. 17, 1946, from active participation in the government; he was succeeded as acting president by Alfredo Duhalde, leader of the Radical party. Sen. Jaime Larraín García, an Agrarian party leader, announced on Jan. 1 that he would be a candidate for the presidency in the 1948 elections. Almost immediately after Duhalde had become acting president, he was forced to issue a warning against illegal strikes; the government on Jan. 22 withdrew legal recognition from two striking nitrate unions. This action led to other sympathy strikes and a large protest meeting at Santiago on Jan. 28, the latter culminating in fighting which caused the death of g and the injury of more than 100 persons. The government thereupon proclaimed a state of siege and the Chilean Confederation of Labour, in its turn, called a protest general strike of 24 hours for Jan. 30. The general strike ended Jan. 31, but the situation remained critical and the concurrent cabinet crisis continued until Feb. 2. A cabinet reorganization

occurred Feb. 3 but the following day workers began a new, though only partially successful, three-day general strike. Although strikers were primarily concerned with domestic considerations, on March 6 they demanded a Chilean break in relations with Franco Spain.

The death of President Ríos at Santiago on June 27, 1946, after a lingering illness of cancer of the stomach, threw the political scene into vastly more confusion. Duhalde on July 6 fixed Sept. 4 as the date for new presidential elections. The rightist parties, Conservative, Liberal and Agrarian, attempted to pick a coalition candidate during July but could reach no agreement; their chief possibilities were Arturo Alessandri and José Maza (Liberals), Eduardo Cruz Coke (Conservative) and Jaime Larraín García (Agrarian). The Radicals had a choice between Acting President Duhalde and Gabriel González Videla, former ambassador to France; the nomination ultimately went to González, and the party on July 27 expelled Duhalde from membership for "dereliction" of duties. Duhalde, nevertheless, withdrew from the acting presidency on Aug. 3 to become a presidential candidate, and was succeeded in office by Vice-Adm. Vicente Bielich. Alessandri on Aug. 11 withdrew as a candidate in favour of his son, Fernando Alessandri Rodríguez. The Communists at first appeared to favour their party president, Sen. Elías Lafferte, but later threw their support to González Videla. Socialists under Marmaduque Grove refused to join the leftist coalition and most of them subsequently supported Duhalde, as did the rightist Agrarians.

In the voting on Sept. 4, 1946, González won a plurality of about 48,000 in the 471,890 votes cast; his total was 189,606 to 141,585 votes for Cruz Coke, the Conservative candidate, who was second highest. Fernando Alessandri, the Liberal nominee, received 128,721, and Bernardo Ibáñez, running with some Socialist support, won 11,922. With no candidate thus getting an absolute popular majority, the election was thrown, according to constitutional procedure, into vote of the congress, which on Oct. 24 confirmed the election of González by a vote of 138-46. (R. H. FN.)

Chile's Political Cauldron.—English parliamentary methods were the first to influence the republic of Chile; they were followed by a trend toward French parliamentarism, which along with its virtues brought its vices of oratory (a Latin passion) and the resultant slowness which accompanies verbosity. During the decade 1937-46, several other influences, notably those of Switzerland and the United States, could be noticed, as well as the postwar infiltration of Marxist ideas, which increased or decreased with the sway of world politics.

President Alessandri succeeded in bridling the excesses of parliament and in expanding the powers of the executive to the obvious benefit of the nation. The vigilance exercised by an already conscious electorate over the work of congress and the administration itself increased to such an extent that this by itself could be considered a symptom of political maturity. But perhaps the decline of electoral abuses should be called the major event of the decade 1937-46.

Suffrage was an event without any real significance, as only a small minority exercised the right to vote. This very group of the population was in fact perverted by the direct or indirect, actual or oblique, corruption of the individual voter. Among the rural population especially, the results of an election did not give a true indication of popular trends. The legitimacy of the elections, however, and the purity of popular conscience increased enor-

mously during the decade. Popular education, which was beginning to reach the most outlying zones, together with the higher calibre of political candidates contributed toward this end.

"Islands" in the Andes and other extremely isolated spots continued to exist, created by the topography of the country; and these still resisted unification and centralization. But the "small, intelligent and virile nation" was emerging victorious over its geographical disadvantages."

The conservative classes looked with some anxiety at the rapid advance of communism (one result of the increased number of voters), but level-headed foreign observers believed that this phenomenon was a natural development. Unfinished primary education of two, three or four years produces voters in the factory, on the farm and in the mountains whose elemental mentality tends immediately toward drastic, totalitarian, immediate solutions. They had acquired no knowledge of the charm and pleasure

of true individual liberty.

These same voters were bound sooner or later to progress in their evolution; it was in the interest of the educated classes that this process be accelerated and shortened. Uruguay and Argentina were examples of the totalitarian disease, rural as well as urban, and those who felt alarmed at the prospects in Chile should be calmed and take

The Chilean temperament, as seen by various travellers and writers, was instructive in this respect. The nation had always been attracted to liberty, loving it with a quiet strength in normal times, but with a kind of desperate love when it disappeared. Chileans would accept even a miserable existence very gladly if it provided for the rights of the individual and the general enjoyment of peace and liberty, more by instinct than by conscious decision. Tyranny and even mere intervention irritated them.

In any case, the surest antidote for totalitarianism caused by popular desperation continued to be a farreaching and carefully planned agricultural reform, and betterment for the hard life of the miners.

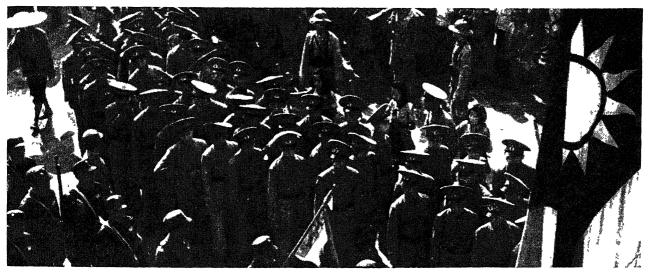
(G. Mis.)

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Chili

See Spices.

		Chile: Statistical Data					
	Value	1938 Amount or	Value	1940 Amount or	Value	1942 Amount or	
ltem	(000's omitted)		(000's omitted		(000's omitted)	Number	
Exchange rate		1 5 1		1 peso = 5.1 cents		1 peso = 5.1 cent	
United States Great Britain		1 peso = 5.1 cents 116 to 126 pesos		77.96 pesos =£1		77.96 pesos = £1	
		=£1		(1941)			
Finance Government	\$346,008		\$422,845				
revenues	(£70,773)		(£110,403)				
Government expenditures	\$342,929 (£70,143)		\$453,795 (£118,484)				
Gold reserves	\$30,503		\$30,276				
National debt	(£6,239) \$1,881,899		(£7,905) \$1,896,120				
radional debi	(£384,925)		(£495,070)				
ransportation		5.000					
Railroads		5,020 mi. 23,000 ,,					
Waterways (rivers).		507 ,,					
Airways		2,308 "					
Communication Telephones		70,867		90,943*			
Telegraph lines		29,280 mi.		15,598 mi.*			
Radio sets		150,000		200,000*			
Minerals Coal		2,271,840 tons		2,135,638 tons		2,508,525 tons	
Copper		372,908 ,,		371,502 ,,		549,305 ,,	
Copper ore (copper content)		387,348 ,,		388,021 "		9,432 ,, 1	
iron		1,771,452 ,,		1,927,281		19,478 ,,	
Crops							
Wheat Potatoes		908,626 ,, 482,146 ,,				1,002,136 ,, 3 486,730 ,,	
Barley		179,785 ,,				88,321 ,, ;	
Oats		132,717 "				112,654 ,, ‡	
orest products Timber	1	65,400,000 bd.ft.		273,981,750 bd.ft.			
Quillai bark	, .	2,756 tons					
ea products		40.000.48		42.004 . *			
Total Cod		40,282 tons § 9,051 ,, §		41,204 tons* 9,795 ,, *			
Oysters and other							
shellfish		8,423 ,, § 6,949 ,, §		9,218 ,, * 4,268 ,, *			
ports—total	\$140,725	4,661,000 tons	\$139,971	4,396,000 tons	\$179,195	2,746,000 tons	
	(£28,784)		(£36,546)		(£44,410)	F. / F. 0.00	
Copper bars	\$67,769 (£13,862)	385,000 .,	\$78,453 (£20,484)	393,000 ,,	\$118,244 (£29,305)	545,000 ,,	
Nitrate	\$29,175	1,733,000	\$26,401	1,560,000 "	\$23,012	1,330,000 "	
Gold, silver ores,	(£5,967) \$6,331	•••	(£6,893) \$6,314	166,000 ,,	(£5,703) \$1,512	40,000 ,,	
concentrates and	\$6,331 (£1,295)	**	(£1,649)	, 11	(£375)	, ,,	
Wool	\$5,223	11,000 tons	\$4,813	12,000 ,,	\$4,607	8,000 ,,	
	(£1,068)		(£1,257)		(£1,142)	2,300 ,,	
ports—total	\$102,835 (£21,034)	• • •	\$104,197	•••	\$128,352	1,754,621 tons	
Petroleum and	\$9,259	• • •	(£27,205)		(£31,810) \$14,909	972,665 "	
products Automobiles and	(£1,894) \$4,133	5,321			(£3,093)		
chassis	(£845)		\$4,317 (£1,127)	5,227	\$1,998 (£495)	1,244	
Yarn and thread .	\$4,125 (£844)	5,625 tons	\$6,336	7,398 tons	\$5,984	4,251 tons	
Sugar (raw)	\$3,781	150,319 ,,	(£1,654) \$5,676	153,771 ,,	(£1,483) \$9,666	175,819 ,,	
	(£773)		(£1,482)		(£2,396)	,5., ,,	
efense Standing army							
personnel		36,645		40,915			
Reserves Standing navy		160,000		212,000			
personnel		8,000		8,000			
Standing air force personnel		1,872					
Reserves	****	850		2,962 100			
Military expenditures	\$100,095 (£20,474)		***	•			
ducation	(220,474)						
Government and							
private primary schools		4,651 §					
Enrolment		602,437§					
Public and private secondary schools		· -					
Enrolment		261 § 44,404 §					
Special schools Enrolment		151§					
Universities		32,176 § 4 §					
Enrolment		44498					



Military ceremonies in Chungking on July 7, 1942, marking the fifth anniversary of China's war with Japan

China

With the recognition of the independence of Outer Mongolia and the restoration of Taiwan (Formosa) and Manchuria (in 1945, 9 provinces, previously 3) China had 34 provinces and two special areas, Tibet and Taiwan, totalling about 3,858,900 sq.mi. According to the ministry of interior, the estimated population of China in March 1945 was 454,928,000, excluding more than 6,000,000 in Taiwan. The estimated population of the leading cities in March 1945 was: Nanking (capital), 1,019,148; Shanghai, 3,726,757; Peiping, 1,550,561; Tientsin, 1,217,646; Chungking, 1,037,630; Canton, 1,115,000. (X.)

Japan's Plot.—In its thousands of years of history, it is doubtful whether China had ever experienced a more momentous decade than that from 1937 through 1946. Not only was there a rapid succession of events of major importance within the country but changes occurred in the pattern of world affairs concerning China which would not have taken place in the normal course for a century.

The Sino-Japanese war was not of China's seeking, and China sought to stave it off by making concession after concession to Japan until its hand was forced by the Marco Polo bridge "incident" which proved to be the curtain raiser of the bitterest war drama ever staged in the far east. That "incident" was curiously similar to the one Japan used as a pretext to justify its occupation of Mukden on Sept. 18, 1931, which was followed by the complete seizure of Manchuria and the subsequent establishment of "Manchoukuo." Japan gave as the excuse for this action the alleged tampering with the roadbed of the South Manchuria railway. The excuse for starting the Sino-Japanese war was even more flimsy. Manoeuvres or night exercises were being held by Japanese troops in the Marco Polo bridge area near the walled city of Wanping on July 7, 1937, despite the fact that the historical bridge was not included in the areas where foreign troops were allowed by treaty to hold manoeuvres. The Japanese officer in command of the troops, nevertheless, demanded the right to enter Wanping and search for one of his soldiers who was said to be missing. When the demand was refused, he opened shellfire on the city and the war had begun.

Nearly all Japan's political and military actions since the presentation of the Twenty-One Demands in 1915, which sought to impose its suzerainty upon China, had indicated that nothing short of the complete subjugation of China would satisfy the island empire. China's immense natural resources, manpower and market were necessary for the establishment of Japan's "new order in east Asia," as a preliminary step to its ambition to attain world domination. Japan had tried in vain to induce China to join a Japan-China-Manchuria bloc. Having failed to gain political and economic control over China by persuasive methods and political pressure—a failure testified to by the unlooked-for scope and vigour of China's nationwide boycott against Japanese goods and the ever-increasing tempo of China's awakening to national consciousness-Japan resolved to resort to force. Japan felt that China was making such national progress that the opportunity was swiftly passing, and it was literally a case of now or never. Japan created the Marco Polo bridge "incident" as a springboard for putting its military machine in motion.

The Japanese, militarists and civilians alike, expected a short and successful war. Prince Konoye, then Japanese premier, declared that China would be forced to its knees within three months. Throughout the eight subsequent years, Japan not only refrained from making a declaration of war but also consistently referred to the war as the "China incident." Japan abstained from any formal declaration in order to circumvent the U.S. Neutrality act and enable it to continue the purchase of scrap-iron, steel, gasoline, aeroplanes and other war materials from the United States. The declaration actually came from China on Dec. 9, 1941, when it also declared war on Germany and Italy.

In its dealings with China, one consistent feature of Japan's policy was to insist, when incidents were created, that they should be settled by the local authorities and not through diplomatic channels, as much greater and more immediate pressure could be imposed upon local officials than upon the national government. Japan insisted that the Marco Polo bridge affair should be so settled and, in fact, did compel the Hopei-Chahar Military council to grant some of its demands. The national government, however, took exception to the Japanese attitude and maintained that matters affecting national sovereignty could not be left to provincial officials. While negotiations were being held, Japanese reinforcements were pouring in from Manchuria and Korea to seize Tientsin and Peiping. The Chinese troops were withdrawn southward.

Hostilities in Shanghai broke out on Aug. 13, 1937, as a consequence of a Japanese petty officer being killed when attempting illegally to enter the Hungjao airfield.

Another feature of Japan's policy was to discredit the

west. Japan lost no opportunity to impress upon China that it held in contempt the democratic powers and that, in looking there for assistance, China was leaning on fragile reeds. The Japanese on Sept. 7, 1937, bombed from the air a car in which British Ambassador Sir Hughe Knatchbull-Hugessen was travelling, wounding him severely. On Dec. 12, 1937, they bombed and sank the U.S.S. "Panay" and shelled H.M.S. "Ladybird" and H.M.S. "Bee" in the Yangtze river near Nanking. Later, the Japanese blockaded the British and French concessions at Tientsin, the blockade being accompanied by the infliction of unspeakable humiliations on western women residents in the British and French concessions. While carrying out this policy of defiance to the west, Japan, before Pearl Harbor, astutely seized every opportunity of showing greater regard for U.S. interests than for British with the obvious hope of playing off these powers against one an-

A third feature of Japan's policy was to form puppet administrations in areas which came under its control. That feature of the policy had begun in Manchuria when Japan installed Henry Pu Yi as emperor of "Manchoukuo." Regimes similar in nature were formed in Kweisui, Peiping and Nanking, and later these were consolidated to some extent under Wang Ching-wei who turned traitor in Dec. 1938.

Japan strove systematically to terrify the people into submission by brutal treatment and by robbing them of all means of livelihood. The behaviour of the Japanese army at Nanking, when they indulged in a wild orgy of murder, arson and rape which aroused the horror and disgust of the civilized world, is a classic example. In later years, Japan attempted, by softening its methods, to induce the people to give voluntarily the co-operation which previously they had reluctantly accorded only under coercion. These efforts were, in the main, unsuccessful. But throughout the war Japan sought to debauch the morale of the people in forcing upon them opium, morphia, heroin and other deadly narcotics. One-third of the people in Manchuria were made drug addicts, and in other parts of occupied China similar tactics obtained.

Responsible Chinese civilian and military authorities were fully aware that China could not hope for victory in positional warfare. They deduced, however, from the trend of the world's political currents that a total world war could not long be delayed and that China would have a better chance of success when like-minded nations were forced, by the logic of events, to perceive at last that China's cause was their own. China could, meanwhile, make a valuable contribution to what it had long sensed would be another world war by keeping the Japanese at bay through guerrilla methods and, aided by time, space and the scorched earth policy, give the western powers time to prepare for what it felt to be inevitable. To make this contribution, nevertheless, entailed a terrible strain. The equipment of most of China's troops was inadequate and semiobsolete, and the country was not organized to meet the demands of protracted hostilities. China had no navy, and only an embryo air force. It had practically no heavy industries, and such light industries as China possessed were in coastal regions that were bound to fall to the Japanese soon after war started. These industries were, moreover, mainly under foreign control. In effect, China had to make preparation for war after war had already begun and perform, metaphorically, the feat of making bricks without straw.

Nevertheless the morale and fighting qualities of the Chinese soldier as exemplified in the battles of Shanghai, Taierchwang, Changsha, Changteh and Kunlunkwan, and the battles in Burma came as a surprise to most western observers, who at first were almost unanimous in the belief that China would speedily be vanquished. China, however, had faith that its two priceless assets, the character and number of its people and the vast extent of its territory, would be decisive in a prolonged struggle, and that China would eventually emerge victorious. This inspired the national leader, Chiang Kai-shek, and the Chinese people to enter upon a struggle which, they were repeatedly told by friends and foes, was hopeless from the beginning The miracle was that from 1937-41, China fought alone against the world's third most powerful nation. Even after Pearl Harbor China received comparatively little military aid from the outside world. Soviet Russia, before waging war with Germany, did send some pilots, planes and other war matériel, but owing to the difficulties of transportation over the Old Silk route, no appreciable amount trickled in. The United States, through lend-lease arrangements, provided China with the equipment for the Flying Tigers, known as the American Volunteer group, organized under General Claire Chennault on Aug. 1, 1941. This famous group, which possessed only 75 semiobsolete planes, was of the greatest assistance in uplifting Chinese morale; for after having fought alone for four years, the Chinese army and people were physically, mentally and spiritually weary. The Flying Tigers patrolled the Burma road, protected Chinese cities from indiscriminate bombing and inflicted heavy losses on Japanese shipping.

After the joint declaration of the United Nations was signed on Jan. 1, 1942, Generalissimo Chiang Kai-shek became supreme commander of the Allied forces in the China theatre. Contrary to China's hopes and expectations, Japan, instead of being checked, continued for some months to make incredible gains and advances in the Pacific. Three months after Pearl Harbor, Japan had severed China's last good supply route-the Burma road. All ports and other roads leading to the outside world had long been lost. There remained only the highly hazardous and inadequate air route through Assam over the Himalayan mountains. War also dislocated seriously China's internal communications. Of some 9,150 mi. of railway in China proper, sections of which had been feverishly constructed during the early phases of the war, all but one tenth eventually fell into Japanese hands. This also held true of the interprovincial highways.

China's contribution to the war effort which led to Japan's surrender in 1945, can be summed up as follows. First, China held Japan's military might at bay while giving the western powers time to prepare for the inevitable struggle. By 1945, China was holding 50 Japanese divisions in China proper, or two-fifths of the entire Japanese army, and 22 divisions in Manchuria. Second, although lacking even the elemental machinery and mechanized conveniences in everyday use in Europe and the United States, China built by human labour enormous airfields from which U.S. planes could take off to bomb Japanese installations and navy.

World Relations.—When the war started, China was on good terms with all the most important countries in the world except Japan. Significance should be attached to the fact that on Aug. 21, 1937, shortly after hostilities began, a Sino-soviet nonaggression treaty was concluded. The people in all countries, with the exception of those in the axis nations, unanimously condemned Japan and supported China. Their governments, however, at first lim-

ited their action to voicing platitudes regarding the necessity of preserving peace and to presenting paper protests to Japan. The United States and Great Britain were too much occupied with their own affairs to give China more than perfunctory moral support.

China, therefore, on Sept. 15, 1937, made a formal appeal to the League of Nations. The League assembly on Oct. 6 pledged support and pronounced Japan guilty of invading China in violation of its treaty obligations. This was followed by a nine-power conference held at Brussels, Belgium, which, on Nov. 24, adjourned indefinitely after urging a suspension of hostilities. The League council from time to time recommended individual aid to China by member states but at no time recommended collective action. On Sept. 20, 1938, the council complied with China's request for application of article XVII of the League covenant and proposed that Japan should accept league jurisdiction in its dispute with China. Japan reacted by severing relations with the league on Oct. 27.

From then on, in China as elsewhere, the pattern of world trends followed inexorably the sharp demarcation drawn between the policies and interests of the fascist nations as opposed to those of the rest of the world. This pattern became clearer in the increasingly close relations between the axis countries and Japan on the one hand, and the increasingly open and material support of China by the democracies on the other. Germany, Italy, Rumania and Siam recognized Japan's puppet regimes, and Germany and Italy withdrew their military advisers to China. Vichy agreed to "Japanese protection of peace" throughout Indo-China and the closing of the Indo-China railway to Kunming. The United States of America and the British commonwealth of nations, on their part, began to extend all possible aid to China short of outright military assistance. As a gesture of sympathy with China, and of condemnation of Japan, the United States gave notice on July 26, 1939, of its intention to abrogate the U.S.-Japanese treaty of 1911, and on July 25, 1941, the United States ordered freezing of Japanese and Chinese assets in that country. The Chinese assets were frozen at the request of the Chinese government. On the same date, Great Britain ordered the freezing of the assets of the two countries and the cancellation of the Anglo-Japanese treaty of commerce and navigation. The United States's application of the Neutrality act at first proved of more benefit to Japan than to China and Great Britain's closing of the Burma road, although temporary, added further hardships. But the United States, Great Britain and soviet Russia at critical times all extended credit loans to China either for obtaining war munitions or for stabilizing its currency, and in April 1941 the United States listed China as one of the beneficiaries of lend-lease.

Because of the adoption of the "Hitler first" policy, China received little immediate aid from lend-lease. Official U.S. information revealed that up to Oct. 2, 1944, China's share amounted to less than 0.5% of the lend-lease exports totalling \$21,534,000,000. Nonetheless, however little, lend-lease proved of substantial assistance to China, as it helped China to train a portion of its armed forces both in China and India and enabled it to send air and navy personnel to be trained in the United States.

Probably the most important development in foreign relations during the war years was the abrogation of extraterritoriality by the United States and Great Britain. Although by its participation in World War I, China had made a breach in the bastion of extraterritoriality, as long as the more important of the western nations held out it remained a semicolonial country and the citadel of in-

equality stood intact. Nominally a sovereign state, the exercise of its sovereign power was subject to the veto of the least of the nations with which China had treaty relations, since most of the treaties contained the most-favoured-nation clause. In 1941, in recognition of China's war effort, the United States and Great Britain, individually but after consultation, notified China that they were prepared to negotiate new and equal treaties shorn of the humiliating and offensive features which China so greatly resented. These treaties were signed on Jan. 11, 1943, and ratified on May 20 of that year. Later in the same year, the U.S. congress repealed the Chinese Exclusion act. Similar action was taken by El Salvador, Costa Rica and Honduras in 1944. Soviet Russia, soon after the downfall of the tsarist government, had voluntarily relinquished its extraterritorial privileges.

Various other treaties with foreign powers increased the atmosphere of good will. Among them may be mentioned those with Canada and France in which these countries also surrendered extraterritorial privileges, the Sino-Iraq treaty of friendship and a treaty of friendship and alliance with the U.S.S.R. In this treaty, signed Aug. 14, 1945, the U.S.S.R. agreed to render support and aid to the national government as the central government of China, and also stated that it had no intention of interfering in China's internal affairs. In notes which formed part of the treaty, China agreed to the full independence of Outer Mongolia and to the joint operation by China and Russia of the Changchun railway. Furthermore, China agreed to share Port Arthur with Russia as "an exclusive naval base . . . used only by Chinese and soviet military and commercial vessels," and consented to the harbour master of the port of Dairen being a Russian national.

Even before Pearl Harbor, the United States, Great Britain and the U.S.S.R. sent military missions to China, while in 1942, after the joint declaration of the United Nations was signed in Washington, China sent military missions to the United States and Great Britain. The friendliness and sympathy felt by the peoples of these and other countries were shown by their spontaneous action in raising relief funds and sending medical supplies to China's war sufferers. The United China Relief, including its co-ordinated organizations, and the British United Aid to China gave noteworthy assistance throughout the war years.

Chinese labourers levelling an air strip with stone rollers at Hsintsin, one of the many bases built by native labour in China for the U.S. air transport command



Aside from the purely governmental agencies, instrumental in establishing better understanding between China and the outside world, the frequent exchange of visits between important personalities of the United Nations and China resulted in closer co-operation. The traditional friendship between China and India was also strengthened during the war by the visit to China of Pandit Nehru and the visit to India of the generalissimo.

The Cairo conference, at which the generalissimo met President Franklin D. Roosevelt and Prime Minister Winston Churchill, resulted in a statement that the three leaders had agreed that "all the territories Japan has stolen from China such as Manchuria, Formosa, and the Pescadores shall be restored to the Republic of China," and that "in due course Korea shall become free and independent." After the Potsdam conference, which China did not attend, a joint proclamation was issued in the names of Truman, Chiang and Churchill, calling upon Japan unconditionally to surrender.

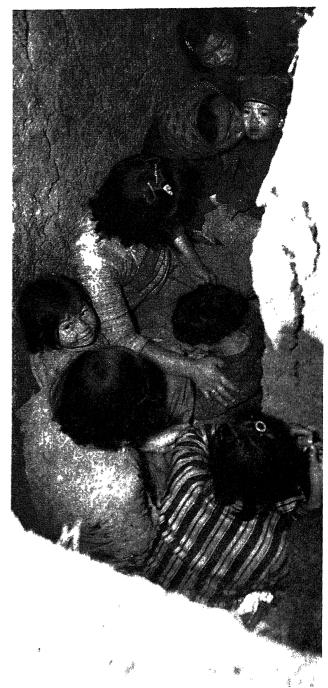
Australia and Canada initiated diplomatic relations during the war years. Other countries in South and Central America, in Europe, in Africa and in Asia, either established diplomatic relations for the first time or raised the status of their legations. Good relations with France were re-established after the Vichy government collapsed.

China took an active part in the organization of the United Nations. It participated in the international conferences on relief and rehabilitation, on food, on monetary and financial matters, on international aviation, on war crimes and on international security. Finally, China played a leading role at the United Nations World Security conference in San Francisco at which the United Nations was born. Confirmation of the new status that China had gained as a great power was given by its position as a permanent member of the Security council with France, the U.S.S.R., Great Britain and the United States.

Domestic Problems.—From 1925-37, the national government had been waging long and costly campaigns against regional warlords and the Chinese Communists. Although it had succeeded in eliminating warlordism, the Communists had never consented to relinquish their quasi-independent status which was incompatible with national unity.

The years immediately before the war brought to the surface within the country paradoxical trends of thought. Generalissimo Chiang Kai-shek was popularly acclaimed as the only possible national leader; in the same breath he was castigated for not waging an immediate war of resistance. In the capacity of national leader, he had to maintain patriotic fervour at a pitch which would steel the people willingly to undergo great privation and simultaneously to restrain them from imprudent actions before preparations for defense were further advanced. His was a difficult and perplexing position. If he publicly disclosed China's unpreparedness, he would have dealt a telling blow to national morale, and would certainly have spurred Japan to instant action. If he yielded to the insensate clamour for immediate war-reminiscent of the cries of "à Berlin" which led Napoleon III and the French empire to Sedan-China would probably have been crushed in a few months, perhaps not to rise again as an independent state for decades.

When war actually came, China was confronted not only by war problems, but also with the added necessity of putting its house in order, politically, economically and socially. The gravest political problem was still the dissen-



Huddled together in a slit trench, these Chinese women and children awaited an all-clear signal during an air raid in 1944

sion between the national government and the Communist party. That spectre hovered menacingly over the nation before, during and after the war. It had not yet been laid low by the end of the decade. But on several occasions it appeared that a satisfactory settlement might be reached. On Sept. 23, 1937, the Chinese Communists promised publicly to co-operate with the government, to abandon their policy of overthrowing it by armed force, to abolish their separate government at Yenan and to place their army under the direct control of the National Military council. Prospects of national unity had never looked brighter. The communist 8th route army was forthwith reorganized and became the 18th group of the national army, and the Communists were permitted to recruit the new 4th army. Friction, however, soon developed between these armies (the

officers of which were appointed by the Communists), and the government forces in the field. After 1938 the communist armies operated independently of the National Military council. Accusations of non-co-operation and obstruction were constantly interchanged; and armed clashes became frequent. In Jan. 1941 the National Military council ordered the disbandment of the new 4th army, but the order was disregarded. Meanwhile Yenan continued to function with its own administrative organs, currency and other appurtenances of a separate, independent government. The areas under communist control widened as war progressed, and the number of local administrations under Yenan and independent of the national government increased. Thus a condition of imperium in imperio existed sust as prior to the war, and with added areas. The situation became so charged with explosive possibilities that in Aug. 1945 the generalissimo (who, at the death of Lin Sen in 1943, had become chairman of the National government), invited Mao Tse-tung, political head of the Communist party, to Chungking in the hope of reaching a fundamental solution. Mao's visit to the war capital nevertheless brought no appreciable result.

Upon the resignation of General Patrick Hurley as U.S. ambassador to China, General George C. Marshall was sent by President Truman as his special envoy to China with ambassadorial rank. Relations between the government and the Communist party tended to improve under his indefatigable efforts to promote understanding and dissipate suspicion, although sporadic fighting still continued. The task of attempting to allay mutual distrust and fear proved difficult owing to the fact that for the previous 20odd years friction between the two had intensified and grown more bitter. For the purpose of effecting a settlement among all political parties, the Political Consultative conference was brought into being on Jan. 10, 1946. The 38 delegates to the council represented the Kuomintang, the Communists, the Democratic league, the Youth party and non-partisan organizations. At this conference resolutions were passed relating to government reorganization, peaceful national reconstruction, adjustment of military affairs, the convocation of the National assembly and the draft constitution. (See below.)

About the same time a separate committee of three, consisting of General Marshall as chairman and representatives from the government and the Communists, was also carrying on negotiations and eventually signed three important agreements: the cease-fire agreement of Jan. 10; the restoration of communications agreement of Feb. 9; and the military reorganization agreement of Feb. 25. The cease-fire agreement pointed out that "it does not prejudice military movements of the forces of the National Army into and within Manchuria which are for the purpose of restoring Chinese sovereignty." An executive headquarters composed of the commissioners and staffs representing the United States, the national government and the Communist party was set up in Peiping to effect the practical implementation of these agreements.

In the spring of 1946, during General Marshall's temporary absence in the United States, the situation took a turn for the worse. Despite the cease-fire and communications agreements, a recrudescence of fighting occurred in north China and gradually spread to other parts of the country. Sections of railways north of the Yangtze which had just been repaired were destroyed by communist armed forces. While the national forces were in the process of taking over sovereignty of territory vacated by the Russians, the Chinese Communists, contrary to the provision in the cease-fire agreement, rushed large forces into Man-

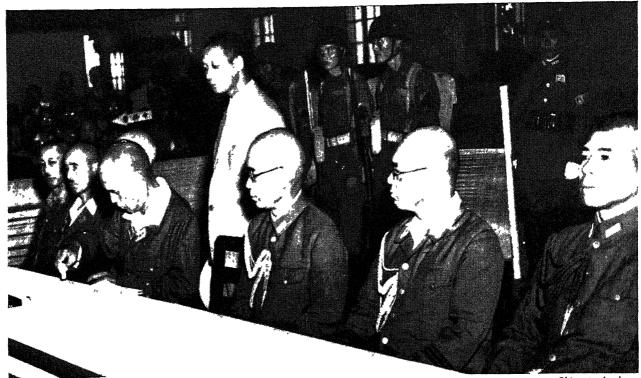
churia. In the case of Changchun, Yingkow and other strategic centres, the communist troops launched vigorous attacks on the skeleton national forces sent as token garrisons of the national government. Government forces counterattacked successfully and drove the Communists northward. The outlook further worsened when Mao Tsetung issued an order for general communist mobilization in Aug. 1946 and this was followed by intensified fighting in nine provinces. Meanwhile the Communist party declared that it would refuse to participate in the National assembly set for Nov. 12, 1946. The government had, on previous occasions, offered to hold this national convention to adopt the draft constitution which would end the political tutelage of the Kuomintang by returning power to the people.

The mediation of General Marshall, assisted by J. Leighton Stuart, newly-appointed U.S. ambassador to China, was rendered more arduous by the Communist demand that all U.S. troops should be withdrawn from China, coupled with accusations that the United States was giving direct assistance to the government. Yenan broadcasts and newspapers adopted a corrosive anti-U.S. tone, and communist armed forces on several occasions kidnapped, attacked and killed U.S. marines. Nevertheless, General Marshall and Stuart, in the summer of 1946, strove to break the government-Communist deadlock by seeking to create a committee to secure an agreement regarding the composition of the state council, the highest governmental organ, as an essential preliminary of cessation of hostilities and the formation of a coalition government.

Aside from the attempted solution of the communist question, many other political developments took place during the decade. The government strove to familiarize the people with the elective system for the hsien (district) and provincial assemblies as a step to train them to use a wider franchise. Another step taken to educate the people in representative government was the creation of the People's Political council "to utilize the best minds in national affairs and to rally all elements in the country in time of war." In 1938, at the first session of the P.P.C., the membership of 200 was selective, but in 1945 two-thirds of the members were elected. The functions of the council included preliminary investigation of the budget, interpellation of the government and its officials and recommendations to the government on national affairs.

Of the border regions, Tibet, throughout the war, manifested its loyalty in various ways, and in 1944 presented 25 warplanes to the Chinese air force. In May 1946 a Tibetan delegation of good will visited Chungking. Sinkiang, by reason of its geographical proximity, had close relations with the U.S.S.R., but in 1942 it came definitely within the government fold, and, despite local clashes in 1945, all outstanding questions were satisfactorily settled. To facilitate administration, Manchuria, formerly divided into the three northeastern provinces, was redivided into nine provinces. A new province, Sikang, had previously been created from parts of Tibet and Szechwan with a similar object in view.

In the earlier phases of the war, the influx of millions of people into the interior, fleeing from the advancing Japanese armies, caused new and difficult situations. To meet these, the government created the Ministry of Economic Affairs, the Ministry of Food and the National Relief commission, the precursor of the Chinese National Relief and Rehabilitation administration. In 1937 China had some 4,000 factories. Of this number, 30% were in Shang-



Surrender of about 1,000,000 Japanese troops in China took place at Nanking on Sept. 9, 1945 (Chinese time). Gen. Yasuji Okamura, seen stamping the document, signed for Japan; Gen. Ho Ying-chin accepted for the Chinese government

hai alone, and another 50% were scattered along the coastal provinces. When hostilities broke out, the economic affairs ministry moved the arsenals and other workshops engaged in war production into the interior, and assisted as many private enterprises as possible in their removal of machinery and personnel. Despite the risks of frequent bombing raids, work in free China continued uninterrupted inside the natural rock caves where some of the plants were hastily housed, although production greatly suffered from the destruction of power plants. A War Production board was set up in 1943. By the end of 1945 the number of factories equalled the prewar total.

Both the Ministries of Food and Economic Affairs were empowered to keep prices from rising and to prevent profiteering, and in 1941 their hands were strengthened by the National General Mobilization act. The Ministry of Food, in order to control food supply, instituted a system of collection of land taxes in kind and compulsory purchase (later changed to government borrowing) of foodstuffs from landowners. This and other efforts could not prevent inflation which was aggravated by the following factors: (1) the ever-growing number of refugee mouths to feed; (2) the ever-lessening supplies from the outside world, and (3) the ever-increasing difficulties of transportation from one part of free China to another.

The Ministry of Economic Affairs directed not only economic development during the war, but made plans for expansion in postwar years—one of the most notable being the survey of the Yangtze dam scheme modelled upon the U.S. Tennessee Valley authority. Its program of industrial reconstruction included the encouragement of postwar foreign investments in China. The liberalization of the company and mining laws was a step in that direction.

With the loss of the coastal and river ports, the customs and salt revenues which had served as the backbone of the government's income were curtailed and other sources of revenue somehow had to be found. Three methods were adopted: monopolies, direct taxation and loans. The revenue obtained from direct taxation in 1936 was Ch.\$7,250,

ooo, but in 1943, it advanced to Ch.\$3,781,000,000. Foreign loans included five from the United States totalling \$620,000,000, four from Great Britain totalling £58,000,000, and three from the U.S.S.R. totalling \$250,000,000. Domestic loans from July 1937 to Aug. 1945 produced Ch.\$15,022,000,000, £20,000,000, customs gold units 100,000,000 and U.S. \$200,000,000.

Education necessarily suffered in the war years. The Japanese in the earlier part of the war showed a pronounced animus against educational institutions by razing buildings, destroying libraries, laboratory equipment and all other educational facilities. Later they instituted an educational system of their own in occupied areas and prohibited the use of Chinese textbooks, except those they had specially prepared. A course in Japanese was made obligatory. In a series of Homeric treks to free China. large numbers of teachers and students went further inland. When, after encountering untold privations, they found a refuge, their troubles were by no means ended. Lack of adequate and suitable buildings, shortage of textbooks and other essentials led many educational institutions to amalgamate and pool resources. Some colleges had to move time and again. Flimsy and scarcely legible mimeo graph copies of textbooks were made and their use, especially as only oil lamps and candlelight were available for night work, left a lasting legacy of impaired eyesight. The improvised buildings in which the students shivered or sweltered were overcrowded and ill-adapted to withstand the extremes of cold and heat. Malnutrition prevailed. All these conditions caused an alarming increase of tuberculosis and a lowering of general health.

The rise in the cost of living to astronomical heights throughout these years pressed with exceptional severity on the white-collared class. Those with fixed incomes such as teachers, students and government employees experienced hard times in spite of the government's efforts to afford relief by extending certain privileges in the purchase of the necessities of life. Commodity prices increased over four thousandfold by Aug. 1946. During the war, the exchange rate was kept at Ch.\$20 to \$1, but early in 1946, because of inflation, the rate was Ch.\$2,020 to \$1, and again in Aug. the Chinese dollar suffered further depreciation and the rate became Ch.\$3,350 to \$1.

Attention has already been directed to the fact that the war brought momentous changes to China which would not have occurred normally for a long period of time. Intellectually and socially, the mass migration of refugees to the interior from the coastal and mid-China regions had an electrifying effect on free China. The refugees began to realize from firsthand observation the vastness of their country and the richness of its natural resources, while the mental horizon of the conservative hinter population became broadened through contacts with administrative, technical, educational and social experts. Rural and industrial co-operatives and other social service organizations undoubtedly contributed practical and moral support to national resistance. The free mingling of rural and city elements, too, added vitality and impetus to life in free China. Of necessity, war conditions broke down old customs, some for the better, others for the worse, but in general progress was made towards liberal ideas.

Notwithstanding universal suffering, war neurosis proved the exception. National stamina emerged with its banners frayed but triumphant. Women particularly, during the war, found new channels for activity and service. The Women's Advisory council of the New Life movement was chosen at the National Conference of Women Leaders held in 1938, the first of its kind, to co-ordinate women's participation in war work. Through it, women's organizations all over free China co-operated with the government and with other social and relief agencies. Special emphasis was placed on educating women in their national responsibilities, on assistance to the families of recruits, the wounded and the war orphans.

U.N.R.R.A. and C.N.R.R.A., during the latter part of and after the war, embarked on an ambitious program to rehabilitate and feed the hungry millions. Their work was impeded among other difficulties by the interruption of all means of communication necessary to the free passage of goods and personnel especially in the areas which had suffered pitiful devastation from famine and from the war.

The National government returned to Nanking, its capital, in May 1946. With its return, as far as interruptions to communications permitted, educational, social and other affiliated organizations were moved back to the regions that they had previously been forced to evacuate. After an interval of 51 years, China reassumed sovereignty over Formosa and set up a provincial government there. The acceptance of the surrender of Japanese troops in Indo-China north of latitude 16° N. was entrusted to China, which sent six divisions (about 50,000 men) to Hanoi on Aug. 21, 1945. Having fulfilled its mission, the force completed its withdrawal from Indo-China on June 10, 1946. The disarming of Japanese soldiers and their evacuation from China together with Japanese civilians, with the aid of U.S. naval and military forces, was practically finished by the end of 1946. An undisclosed number of Japanese soldiers was also reported to have been evacuated from Manchuria by the Russian army to Siberia. The new constitution, providing for a parliamentary form of government, was adopted by the National assembly on Dec. 25, 1946.

After a decade, eight painful years of which were spent in a struggle for national survival and freedom, the nation

was weighing its improved international status against the enormous sacrifice of life and economic devastation which, because of internal disunity, had not yet been repaired to any extent. (See also World War II.)

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China: Statistical Data

	19	938	1940		
ltem (Value 000's omitted	Amount or d) Number	Value (ooo's omitted)	Amount or Number	
Exchange rate		1 Yuan = 21 3 cents (7.76d.)		1 Yuan = 6 cents	
Finance Government revenues	\$187,903	(7.7 Od.)		(2½d., 1941)	
Government expenditures	(£38,434) \$202,865				
National debt	(£41,494) \$249,164 (£50,964)				
Transportation Railroads		6,710 mi.* 67,100 mi.*		6,381 mî.‡ 140,587 mî.‡	
Waterways (Yangtze river) Airways		1,630 mi.* 10,980 mi.†		1,630 mi.‡ 4,840 mi.‡	
Minerals		•		•	
Tungsten		17,709,552 lb.		6,873,943§ lb.	
Tin		12,998§ 17,189,266 lb.	tons	11,200 \$ tons 12,109,868 lb.	
Iron		33,069 to	ons	•••	
Crops Rice		52,926,824* tons		37,696,830 tons	
Wheat		19,093,489*		9,098,112	
Barley		7,023,194*		tons 4,066,215∥ tons	
Sugar cane		3,780,228*		•••	
Rape seed		12,190,601 *		2,514,213∥ tons	
Livestock Poultry				168,593,000 ¶ 37,740,000 ¶ 12,727,000 ¶	
Cattle				12,727,000	
Buffaloes	£142 122		£1 1 0 56.4	8,079,000 [[7]	
Exports—Total Cotton (raw)	\$163,133 (£33,367) \$21,574	151,000	\$118,564 (£30,957) \$508	4,000	
Tungsten	(£4,413) \$10,785 (£2,206)	tons 14,000	(£133) \$81 7	3,000	
Eggs and egg products	\$10,525	tons	(£213) \$7,989	tons	
Wood oil	(£2,153) \$8,381 (£1,714)	77,000 tons	(£2,086) \$3,381 (£883)	26,000 tons	
Imports—Total	\$263,938		\$511,469 (£133,543)	•••	
Metals and ores Chemicals and	(£53,986) \$19,285	•••	\$31,268	•••	
pharmaceuticals	.\$16,869 (£3,450)	•••	\$21,616 (£5,644)	•••	
Rice and paddy	\$16,867 (£3,450)	448,000 tons	\$42,852 (£11,189)	716,000 tons	
Machinery and tools .	\$16,568 (£3,389)	•••	\$19,154 (£5,001)	•••	
Defense Standing army					
personnel		900,000		2,000,000 1,000,000	
Standing air force				1,500	
personnel Military expenditures	\$83,83 8 (£17,148)	•••	***	1,000	
Education Primary schools				2107/6	
(21 provinces) Enrolment				212,740 12,180,542	
Middle schools				1,9/3	
Enrolment	•			489,414 113	
Enrolment		_	_	44,422	
*1937. +1939.	194. For 22 of 2.	2. 4 Chinese prov	Exports only- inces.	∥1941.	

658 Chinese Turkestan See Sinklang.

Chocolate

See Cocoa.

Chosen

See KOREA.

Chou En-lai

), Chinese communist leader, was Chou (1898born in Huai An, Kiangsu province, and attended Waseda and Japan universities in Japan and Nankai university in China. A member of a radical student organization in China, Chou was imprisoned in 1919-20 for his part in a student demonstration. After his release he went to Paris, where he became one of the leaders of the Chinese union, a group of Chinese communists in exile. He returned to China in 1924 and, together with the other communists, joined Sun Yat-sen's party in the nationalist revolution of 1925. Chief of the Whampoa military academy under Chiang Kai-shek and in charge of Communist party political affairs in the Kuomintang armies, Chou led the nationalist army in the capture of Shanghai. When Chiang later ordered the arrest of the communists and sentenced their leaders to death, Chou escaped and joined in the organization of the Chinese Red army. With the opening of a new offensive by Chiang in 1933, Chou was one of the leaders in the northern drive of the Red army. In spite of the civil war, Chou continued to urge a compromise with the Kuomintang and a united campaign against the Japanese. Thus, when Chiang was kidnapped in 1936, Chou was largely responsible for his release. With the culmination of the united front between communist and nationalist forces, Chou became military adviser to Chiang and, in 1938, vice-director of the political department of the military council of the 8th route army. The rupture between the two Chinese parties again appeared in 1941, when Chiang refused the demands of the communists for the legalization of the Communist party and the independent maintenance of the Red army.

Chou, second only to Gen. Mao Tse-tung in communist ranks, was active in the negotiations leading to a temporary accord between the Kuomintang and the communists in Jan. Feb. 1946.

Christian X

King Christian of Denmark (1870—) was born at Charlottenlund castle near Copenhagen, on Sept. 26, 1870. Nephew of Queen Alexandra of Great Britain, he succeeded his father, Frederick VIII, in 1912.

Standing high physically, King Christian continued to stand high politically during the decade 1937–46. As monarch of a democratic people, he showed unusual ability in maintaining contact with the people on the one hand, and in preserving the dignity and detachment of his office on the other hand. His years-long habit of a morning horseback ride through the streets of Copenhagen was broken only when he fell from his horse, Oct. 19, 1942, and was seriously injured; pneumonia followed, and the nation worried, but the king recovered slowly, and the continuity of the monarchy was undisturbed in the critical war years.

Undoubtedly the king had much to do with Denmark's policy during World War II—a policy which began with yielding to superior force on promise by the nazis to re-

spect the sovereignty of king and nation, but which shifted as the war progressed to more and more open hostility to the Germans. When Hitler sent elaborate greetings to Christian on his 72nd birthday, Sept. 26, 1942, the Danish monarch insulted the fuehrer with the curt reply, "Thank you. Christian, Rex."

When the Germans demanded that the Danes pass anti-Semitic laws, Christian attended a synagogue and is reported to have said that if Jews had to wear a special badge he would wear one too. He refused to obey the German demand that Danish ships be armed.

This was all in keeping with the popular spirit and gave encouragement to the increasing resistance. When open rebellion against the nazis broke out in Aug. 1943, the Germans imprisoned the king at Sorgenfri castle. He returned to his official residence at Amalienborg on Sept. 6, 1944, but was of course not a free agent. Danish rejoicing at their deliverance brought great demonstrations at Amalienborg both at the moment of liberation and again on Sept. 26, 1945, the king's 75th birthday, when royal relatives from Norway and Sweden added their presence to the celebration of Copenhagen and all Denmark, honouring the man who so nobly personified the Danish spirit. (See also Denmark.) (F. D. S.)

Christian Science

In 1936, 70 years after the discovery of Christian Science by Mary Baker Eddy and 57 years after the organization of the Church of Christ, Scientist, the branches of The Mother Church, The First Church of Christ, Scientist, in Boston, Mass., had reached a total of more than 2,700 Christian Science churches and societies throughout the world. The Christian Science Publishing society was continuing its steady growth in the publication of Christian Science literature, consisting in part of the Christian Science Journal, a monthly publication; the Christian Science Sentinel, published weekly; the Christian Science Quarterly; the Herald of Christian Science; and the Christian Science Monitor, an international daily newspaper. By 1936, the magazine section of the Monitor, then in the second year of its publication, had won a prominent place in the literature of the day. In that year, more than 1,000 answers were received in reply to a questionnaire sent by the Monitor to members of the American Economic association, soliciting opinions as to the business situation.

The publication of the classified results attracted wide attention in financial and commercial circles as well as in Washington, D.C.

In 1936, relief was sent abroad to those in need because of economic conditions. Relief totalling \$58,750 was dispensed to those in distress caused by hurricane in Florida; by earthquake in Montana; by tornado and floods in southern and eastern states. From its inception, the Christian Science Church had taken an active interest in world affairs and responded generously when emergencies arose calling for instant financial aid.

When the hurricane swept the eastern coast in 1938, a cyclone struck Illinois, and a flood did great damage in California, The Mother Church contributed more than \$47,000 for the relief of sufferers in those areas.

As the need for assistance in countries overseas was increased by the exigencies of World War II, The Mother Church and its branches responded generously to the emergency. In 1940, the Christian Science Board of Directors announced the opening of The Mother Church War Relief fund for contributions within the United States to be used "for food and clothing to relieve human

suffering" in some of the countries which were at war. The Christian Science movement endeavoured to assume its share of the responsibility of caring for the need for rest and recreation of the large number of men in U.S. military centres abroad. By the middle of the summer of 1940, rest centres were opened in Aldershot, Great Britain's largest training camp, on one of its busiest streets. Similar centres were opened in other large military camps. Shortly thereafter, a collection and mailing depot was opened by the Christian Science War Relief committee in Boston for the convenience of those who desired to contribute aid for civilians and soldiers in Great Britain in the form of warm winter clothing, as well as knitted articles for men serving in the land, sea, or air forces. By Dec. 1940, the first shipments of clothing sent by the Christian Science War Relief committee arrived in England.

Workers in Great Britain supplied much of the initiative for the war relief work. A war relief fund contributed by Christian Scientists in Great Britain enabled workers there to set up canteen and clothing depots. They were aided in this work by contributions from the Christian Science War Relief fund. Members of Christian Science churches throughout the dominion of Canada, organized as war relief committees of branch Churches of Christ, Scientist, shipped goods direct to British ports and helped to meet wartime needs in Canada.

From the small beginning of 34 cases of clothing shipped abroad in Oct. 1940, the work expanded rapidly to an average of more than 500 cases a month by June of the next year. Each case contained about 200 garments. Clothing came from Christian Science organizations in every state in the union as well as from Cuba, Puerto Rico, Alaska and Hawaii.

During this period, relief also was dispensed in the amount of more than \$150,000 to those communities experiencing losses caused by floods, hurricanes and tornadoes.

By Oct. 1940, more than 1,000 War Relief committees were shipping garments to Boston or to one of the three depots functioning in New York; Portland, Ore.; and Los Angeles. Shipments from those centres went direct to England. Christian Science literature at this time was being sent free of charge into almost all of the countries in Europe with the exception of the axis countries and those under their dominion.

In 1940 also, the publication of the new limited subscription edition of the textbook of Christian Science, Science and Health with Key to the Scriptures, written by Mary Baker Eddy and first published in 1875, was announced. This book was not a commercial venture. It was produced in order to have the textbook in a form which would preserve it for the ages. The beauty of its design, quality of materials and excellence of workmanship made it worthy to take its place among the outstanding examples of typography. The volume was issued as a Super Royal Quarto, 10 by 14 in. in size, and 21/2 in. in thickness. It was set in Laurentian type and printed on the best grade of English handmade paper that could be secured. The binding was of the finest quality of Indian Morocco, dyed a deep, permanent blue. The requirements for producing this volume were such as to preclude the possibility of reprinting. That same year the list of publications of The Christian Science Publishing society was extended to include a new book, The Mother Church Extension, by Margaret Williamson. At the annual meeting of The Mother Church in June 1946, it was reported that sales of Science and Health and other books by Mrs. Eddy in 1945 were more than twice those reported in 1940, and that sales were continuing to increase.

By 1941, camp welfare rooms were being maintained at

By 1941, camp welfare rooms were being maintained at points convenient to U.S. camps and military stations. During that year, The Mother Church and its branches in the U.S. shipped more than 700,000 lb. of clothing, valued at more than \$700,000, to Great Britain, where Christian Science committees distributed it for the benefit of sufferers from the war without regard to their religious faiths.

The wartime activities of the Christian Science denomination were expanded in 1942 by the appointment of Christian Science wartime ministers in connection with the armed services. At the end of that year there were more than 100 employed by the Christian Science Church. The wartime ministers conducted Christian Science services, responded to calls for help or healing, provided Christian Science literature, and were available 24 hours a day to help any serviceman who might wish to call on them.

Early in 1942, the editors of the Christian Science Monitor established a Peace department and provided a Peace Aims editor. The importance of the part played by this newspaper in international affairs was attested by the award of the Maria Moors Cabot Plaque by the trustees of Columbia university for promoting understanding and friendship in the western hemisphere. This was the first time a North American newspaper had received this recognition.

During 1943, the Monitor received the F. Wayland Ayer cup for excellence of typography, makeup and presswork, and a medal and citation awarded by the University of Missouri school of journalism for fulfilment of the assignment given to it by Mary Baker Eddy, "to injure no man, but to bless all mankind."

The work of the Christian Science War Relief committee continued unabated, and during 1943 clothing valued at \$256,887 was shipped to England alone for free distribution. Shipments of clothing to the U.S.S.R. amounted to 209,894 lb. Donations of clothing were made to refugees of many nationalities in the United States, Canada, England, and the soviet union, and to the Greeks in Egypt. The War Relief committee also distributed 173,963 pieces of knitted garments to men in the U.S. armed forces.

The Central War Relief committee of the United Kingdom maintained some 120 rest centres.

In 1945, 4 of the 25 Christian Science chaplains serving in the U.S. army received bronze stars for meritorious service.

Literature published by The Christian Science Publishing society was available at all rest and recreation centres provided for servicemen and servicewomen. Two new biographies, Twelve Years with Mary Baker Eddy, by Irving C. Tomlinson, and Mary Baker Eddy, Her Mission and Trumph, by Julia Michael Johnston, were published by the publishing society.

A Christian Science "Church of the Air" program originating over station WHAS in Louisville, Ky., sponsored by The Mother Church, received a certificate of merit from the National Federation of Press Women.

The Monitor received a fire-prevention award of a \$500 gold medal for outstanding service in the field of fire prevention. It also received the Helms Athletic foundation award in recognition of noteworthy achievement in the realm of sports. It won first honourable mention in the over-50,000 circulation group in the Annual Exhibition of Newspaper Typography conducted by N. W. Ayer and Son, Inc.

In 1946, the *Monitor* continued to maintain its large staff of correspondents throughout the world, and returned its correspondents to Moscow and Rome.

In July 1946, the publication of a Spanish translation of the *Herald of Christian Science* was added to the list of *Heralds* published in French, German, Dutch, Scandinavian and in Braille.

Postwar activities consisted in part of supplying Christian Science workers at 133 Veterans' Administration hospitals in the U.S. and Canada. The camp welfare activities of The Mother Church continued to serve military and naval personnel at training camps in the U.S., as well as occupation troops in the European and Pacific theatres. Rehabilitation work with discharged veterans was actively carried on by Christian Science branch church workers.

The Christian Science organization co-operated liberally in collecting and sending food packages to the faminestricken countries abroad.

By the middle of 1946, approximately \$11,000,000 had been expended for relief work in connection with World War II. During the war, more than 100,000 Christian Scientists served in the armed forces throughout the world. At the peak of the wartime activities, there were 26 Christian Science chaplains in the army and navy of the United States, 135 paid wartime ministers serving in the United States, 25 officiating ministers and authorized workers abroad, 481 overseas volunteer wartime workers in the Allied armed forces, and 495 civilian volunteer wartime workers in the United States.

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Christian Unity

The high tide of the Christian Unity movement which culminated in the great occumenical assemblies at Oxford, England, and Edinburgh, Scotland, in 1937 was sadly obstructed during most of the following decade by the tragedy of World War II and the general interruption of communication among churches. On the other hand, the trials of the war period served to drive the channels of the unity movement even deeper than might otherwise have been the case, and gave accentuated significance to the relationships of the churches during the fateful decade. Meanwhile, the U.S. churches had been drawn closer together through the need to present a common front and to exert leadership in a world threatened with disintegration, through the necessity of special religious ministries to U.S. populations suffering mass dislocation through war and war industrial demands, and by the necessities of the largest-scale international job of relief and rehabilitation which had ever challenged the justice and generosity of the Christian churches.

In the realm of co-operative activity, the signal expansion of the Federal Council of Churches of Christ in America (q.v.), in the magnitude of its work, its finances and the professional quality of its services, was of first importance. Budget and staff alike were multiplied three-fold during the decade. The parallel development of state and local councils of churches, organizationally independent of, but closely affiliated with, the council, was equally striking. At the end of 1945, 35 U.S. states had developed inclusive councils of churches, and 13 others had some less inclusive interchurch agency. There were 147 city and country councils employing professional executive

leadership, and 345 city and county councils under voluntary leadership, while many of 1,600 ministerial associations were consciously performing important co-operative functions in behalf of the churches of their community. Within the decade, the British Council of Churches, combining previous co-operative movements and representing both the Church of England and the Free churches, came strongly into action, and the Canadian churches initiated their own council. Numerous national church councils were organized in Europe and the east.

The national meetings of the Federal Council increasingly became joint sessions with the more specialized national interchurch agencies of the United States. A plan launched in 1942 for the merger of eight such agencies and the Federal Council into a new and inclusive council was favourably acted upon by most of the agencies concerned and their constituent denominations, so that its early realization apparently was assured. Most of the major special wartime projects of the Federal Council were cooperatively undertaken with one or more other agencies, national or international. This was particularly true of its extensive war services.

Important additional churches joined the Federal Council, including the Protestant Episcopal, The Church of the Brethren, and the three branches of the Eastern Orthodox Church—the Syrian, Ukrainian and Russian. Local councils increasingly recognized and gained the cooperation of the more sectarian groups as the result of the growth of such groups in responsibility and the broadening of the basis of co-operation to meet the challenge of war services. The major organizations for postwar relief and rehabilitation consolidated.

Outside of the formal negotiations of churches, general attention to issues of Christian unity was heightened by important movements which advocated the general idea or propounded particular schemes for its realization. Prof. Adolph Keller of Geneva, Switzerland, conducted an important series of oecumenical seminars throughout the country. The Federal Council of Churches created a commission for the study of Christian unity without advocating any particular scheme of union. The community church movement became increasingly articulate in its criticism of the denominational system and in its demand for a type of local church life directly derived from the needs of communities. Dr. Stanley Jones persistently advocated a plan of federal union which would maintain denominational bodies but bring them into closer relations in important functions. This movement culminated in 1945 in the organization of the "Association for the Realization of the United Church." In 1946, the Disciples Divinity House of the University of Chicago, Chicago, Ill., announced the inauguration of an annual Christian unity lectureship, the first series to be given by the Protestant Episcopal bishop of Washington, D.C., the Rt. Rev. Angus Dun. From 1940 on, the Washington cathedral was host to an important annual gathering of leaders in the study of church unity problems.

Specifically authorized conversations or negotiations for the actual merger of denominations took place between many churches and in many countries. The merger of the three major Methodist denominations of the United States into the Methodist Church with some 7,000,000 members was consummated in 1939. Final measures for the previously authorized union of Evangelical and Reformed churches were completed. The Evangelical and United Brethren denominations, which had long been conducting conversations, announced a basis of union, which was submitted to each denomination, approved and consum-

mated in Nov. 1946. The northern and southern branches of American Presbyterians continued in active negotiations for union and published a joint Directory of Worship. The Congregational, Christian and Evangelical and Reformed churches promulgated a plan of union through a joint commission and entered into subsequent negotiation over details, with prospect of early consummation of the plan. Later, negotiations were authorized for the possible union of the Reformed Church in America and the United Presbyterian Church. The most far-reaching American proposal for union was that of the Protestant Episcopal and Presbyterian Church, U.S.A., in resolutions by the two churches in 1937-38 declaring that they sought organic union. Negotiations were conducted throughout the decade exploring various lines of approach but without discovering a formula which could finally be agreed upon. The continuation of negotiations was authorized by the Protestant Episcopal Church in 1946, and the advice of the Anglican bishops throughout the world was appealed to.

In Great Britain, an Outline of a Scheme of Union resulting from several years of conversations between special representatives of the Anglican and Free churches was published but was not acted upon formally. In other countries, movements of ecclesiastical unity were partly defensive and partly compulsory on the part of totalitarian nations. English and American Methodists united in Italy in order to strengthen each other. In Japan, under the compulsion of the Japanese government, all Christian churches were forced to unite, some of them unwillingly, in a government-controlled organization. Similar unity was partially forced upon the churches in the occupied portions of North China and in the Philippine Islands. Unification movements were similarly enforced in Germany. Their voluntary continuance in peace was still undecided at the decade's end. In all the oriental countries mentioned, union was in line with long-time and independently-developed tendencies within the church. The most authoritative news from the orient indicated that in all these countries a considerable measure of permanent unity would be retained under freedom.

Important unity movements in north and south India carried negotiations forward, and action in Sept. 1946 by the United Church of south India apparently assured consummation of the long-standing scheme of union in that area.

The Oxford and Edinburgh World conferences of 1937, involving in large measure the same personnel, were the most comprehensive gatherings of formally designated representatives of Christendom in 400 years. Their thinking gave direction to all subsequent unity movements. Identical action in the two conferences set up procedures for inaugurating a permanent World Council of Churches. A representative gathering of delegates to draft its constitution convened in Utrecht, Holland, in 1938 and created provisional machinery for carrying on its work. A North American section was promptly created in joint meetings of U.S. and Canadian delegates of churches. The anticipated early consummation of the formal organization of the council was prevented by World War II, but its work progressed rapidly under the provisional organization. Ninety-four churches in 33 countries on six continents had formally voted to accept membership by the end of the decade. Meanwhile, the important session in east India of the International Missionary council strongly reinforced the movement of unity by the importunities of the younger churches that the missionary-sending churches should cease to obstruct the aspirations, especially of the oriental peoples, for a united Christianity. The Amsterdam World Conference of Christian Youth in 1939 focused the interest of Christian youth upon the world-wide unity movement and gave it the strong backing of the younger generation. Up to the outbreak of European hostilities the continuation machinery of the Oxford and Edinburgh conferences was perpetuated by annual gatherings, and a conference of lay experts, meeting in Switzerland on the eve of World War II, resolved that the ties between the churches should not be broken even by war.

The term occumenical, meaning both world-wide and all-inclusive in content and interest, began to be generally applied to the organized movement of Christian unity. The activities of continuing commissions appointed by the Oxford and Edinburgh conferences were carried out throughout the war period, in the several countries not directly attacked or occupied. U.S. sections of these commissions were unobstructed in their work and issued important reports on the "Doctrine of the Church," "Intercommunion" and on "The Ethical Reality and Function of the Church." Two sets of official replies from the churches of the world to the Edinburgh discussions on unity were issued by the continuation committee. An important North American occumenical conference was held in Toronto, Canada, in 1941. Even in the heat of the war the secretaries of the Geneva headquarters of the World Council of Churches, in process of formation, found it possible to travel extensively among the European nations, including the belligerents. Extensive underground connections were maintained, and representatives of the churches were party to, and actively concerned in, the resistance movement in all occupied countries and in the most important plots to remove Adolf Hitler from power. Several informal meetings of World Council leaders were held in London and Geneva pending the possibility of a formal meeting of the provisional committee later. This was held early in 1946. The American Committee for the World Council reorganized itself so as to be formally representative of the American churches which had sought permanent membership in the council.

Immediately upon the freeing of western Europe from German occupation, representatives of the U.S. and British churches went to gain first-hand impression of European conditions and needs. The reorganized Evangelical Church of Germany was recognized provisionally. General Secretary Samuel McCrea Cavert made three trips and was loaned to the World Council for six months' service in connection with its plans for relief and rehabilitation. In early 1946 an occumenical deputation from the American Federal Council visited Japan. In turn, important World Council leaders made extensive itineraries in the U.S., including the executive secretary, Dr. W. A. Visser 't Hooft, Pastor Boegner, head of the Reformed Church of France, and the bishop of Chichester, England. Late in 1946 the archbishop of Canterbury also visited the United States and Canada and spoke in behalf of the oecumenical movement.

The emergency work of the World Council as well as its permanent activities were greatly aided by the gift of \$1,000,000 from John D. Rockefeller, Jr., one-half for immediate needs and the other half to establish an occumenical institute particularly for the training of lay Christian leaders. U.S. representatives, including Prof. John C. Bennett of Union Theological seminary, New York city, shared in the establishment and the initial work of the

institute. Both the American and the British affiliates of the World Council established active youth departments, and preparations for a world conference of Christian youth to be held in 1947 were actively under way. The first meeting of the full assembly of the World Council, to complete its formal organization, was scheduled for 1948.

* * *

THE PERMANENT LITERATURE of Christian unity was greatly augmented during the decade, first by the publication of the preliminary documents for the Oxford and Edinburgh conferences. These results of co-operative world scholarship appeared in many volumes. The joint committee of the Federal Council and Foreign Missions conference issued in 1940 an important report on "Christian Unity in Foreign Missions." In 1941, the first fulllength study and interpretation of the Federal Council of Churches appeared in the volume We Are Not Divided, by John A. Hutchison. The Church of England in Canada in 1942 issued an important document on the doctrine of the church. The successive pamphlet publications of the Federal Council commission on the bases of a just and durable peace dealt with the application of principles of unity to world affairs and the place of the church in bringing unity about. In 1944 the report of the Federal Council commission on the War in the Light of the Christian Faith, the co-operative work of a large body of Christian scholars, constituted a definitive analysis of the American churches' position on this most poignant of issues. The Federal Council of Churches continued to issue its biennial Year Book of the American Churches, the 1945 issue showing that the American churches had a larger percentage of the total population in their membership than ever before in American history. In 1938 the scholarly oecumenical quarterly Christendom began publication as an organ of the American Committee for the World Council. Numerous local community church surveys undertaken by the committee on co-operative field research gave guidance to states and cities in the development of their co-operative work. The Interseminary Series, an ambitious publication in four volumes, developing both the theological ground and practical application of occumenical ideas, was published at the end of 1946. Also in 1946 appeared the posthumous work of the Rev. William Adams Brown entitled Toward a United Church. It constituted an authoritative study of the occumenical movement in its world-wide aspect by one of its U.S. leaders.

The executive leadership of the World Council in its entire period of formation was in the hands of Dr. W. A. Visser 't Hooft, long connected with international Christian student work, whose ability and steadfastness kept the council's work in focus under most difficult circumstances. Rev. Dr. Douglas Horton, general minister of the Congregational Christian churches, succeeded Dr. William Adams Brown as chairman of the American committee of the World Council.

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Christmas Island See Malayan Union.

Chromite

The demand for chromite expanded at a rate exceeding the average industrial progress. Although production had dropped at the end of each economic cycle, each break was followed by a rapid recovery and an increase to a new high level. World production first surpassed the million ton mark in 1936, with subsequent increases to 2,210,000 short tons in 1942. In fact, production built up so rapidly during the decade 1937–46 that it accounted for close to two-thirds of the total recorded after 1900.

While production data were incomplete for 1944 and 1945, with figures at hand for all major producers except U.S.S.R. it was evident that the small drop in output in 1943 was considerably enlarged, with the 1945 total some where near the prewar level.

The recovery of production in the countries that fell into axis hands (Greece, Yugoslavia and the Philippines) required some time, though progress had already been made in some areas by the end of 1946. The main load of the expanded war demand was carried by Cuba, Rho desia, South Africa, Turkey and U.S.S.R., and these countries consequently faced the heaviest cuts as outputs were readjusted to postwar needs. Much of the Cuban increase was required to replace refractory ores formerly supplied by the Philippines, and future Cuban prospects were to a considerable extent dependent on the success attending the revival of the Philippine industry. In the soviet union. extensive exports were made during the latter war years. after several years in which the entire output was consumed at home. And finally, the direction of the produc tion trend in the postwar years depended on the rate at which industry developed new and expanded established uses for chromium. Previous experience indicated continued expansion in the consumption of chromium; while the unsettled industrial conditions that prevailed after the close of World War II could lead to a temporary slump in production, subsequent expansion was to be expected.

United States.—On the average the United States ab sorbed about half the world output of chromite, the actual proportions varying from as low as one-quarter to one-third in the early 1900s to as high as 60% in later years; during the decade 1937–46 the proportion was about half. Comparative figures of supply and consumption in the two war periods are shown in Table II.

In addition to revealing the increased demand in 1939-45 as compared with 1914-20, these figures show the extent to which the United States was dependent on foreign sources of supply. Viewing the records merely from the standpoint of tonnage produced, the 1939-45 record was much better than that of 1914-20, but in comparison with later demand and with the effort and cost to secure the results, the relative showing was much poorer. Furthermore, much of the 1939-45 output was too low in grade to be salable even under war conditions, and remained in stockpiles.

It was effectively demonstrated on two different occasions that only under war demand could the domestic reserves yield an appreciable output, at best only a fraction of the total required, and that of lower grade than normally required by industry. The availability of foreign supplies became, therefore, a matter of prime importance. This situation was emphasized all the more strongly by the fact that Cuba remained the only important producer in the western hemisphere and all other supplies were subject to the hazards of long overseas transportation. The sources from which these supplies were obtained during 1937-45 are shown in Table III.

Inspection of these figures discloses the extent to which the U.S. war program rested on maintenance of foreign supplies, and the shifts from one source of supply to another as shipping conditions or the progress of the war affected various producers.

The successful maintenance of an adequate war supply in spite of all the difficulties encountered is evidenced by a comparison of the supply and consumption columns for the years 1939 to 1945 in Table II. Each year showed a comfortable margin of surplus over consumption, which was stockpiled for future use in case of interruption of imports. At the end of 1945, the Metals Reserve Co. had 866,333 tons of chromite in storage in the United States, 492,587 tons

stored in foreign ports and 61,550 tons affoat, enroute to the United States, a total of 1,420,470 tons. Even though this record must be discounted to some extent, as about one-third of the ore stored in the United States was of domestic production (much of which was too low in grade to be readily usable) it still stood as a monument to a tremendous effort, made necessary by the U.S. lack of domestic chromite resources.

The stocks accumulated during the war years would presumably be turned over to the permanent stock pile, to be supplemented by future purchases until the amount reached the total recommended by the Army and Navy Munitions board.

The chief uses of chromite are in alloy steels, refractories and chemicals, all of which expanded greatly under war demand, as did the more specialized uses in superhard alloys, resistance alloys and high temperature alloys. Improvements in the latter were especially important in the development of gas turbines and jet-driven planes.

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Chromium

See METALLURGY.

Chronology of Events, 1937-46.

On the following pages are listed the principal events of the decade 1937-46, in chronological order by year, month and day. For elections, disasters and assassinations, see under those headings. For deaths of prominent persons during 1937-46, see under the heading Obituaries.

JANUARY, 1937

2. Anglo-Italian accord was signed; it recognized freedom of communication in Mediterranean as a "vital inter-

Table 1.— World Production of Chromite (Short Tons)									
	1937	1938	1939	1940	1941	1942	1943	1944	1945
Cuba	. 104,270	44,272	65,656	<i>57,</i> 703	179,870	315,779	390,386	211,788	190,288
Greece	. 58,004	46,809	62,932	62,832		44,000*	16,500*		• • •
India	. 69,784	49,447	55,033	62,173	56,152	55,534	37,246		
New Caledonia	. 52,935	57,558	57,320	61,498	71,109	74.637	51,756	60,880	45,003
Philippines	. 77,003	73,757	139,714	214,282	330,000*	55,000*	66,000*		• • •
South Africa		194,625	176,385	180.389	156,400	372,162	179,932	98,005	85,000
So. Rhodesia	. 303,816	205,051	153,313	273.069	357.077	383,950	316.863	305,396	205,380
Turkey	. 212,204	235,487	211,251	187.198	165,681	159,509	216,975	203,457	77,000
U.S.S.R	. 220,000	*				440.000*	358,000*		
United States	. 2,802	909	4,048	2,982	14.259	112.876	160,120	45,629	13,973
Yugoslavia	. 66,064	64,452	65,617	78,285	• • • •	110,000*	72,000*		
Total	. 01,434,000	1,269,000	1,300,000	,633,000	2,055,000	2,210,000 1	,972,000	•••	• • • •

Table II.—Chromite Data for the United States for the periods of World Wars I and II

(in mousands of short tons)								•		
	Pro- duction	lm- ports	Sup- ply		Pro- duction	lm- ports	Sup- ply	Con- sumption		
1914	0.7	83.7	84.4	1939	3.9	355.6	359.9	ş		
1915	3.7	85.7	89.4	1940	3.0	736.6	739.6	562.9		
1916	52.6	129.9	182.5	1941	14.3	1,115.3	1,129.6	800.3		
1917	49.0	80.9	129.9	1942	112.9	981.6	1,094.5	892.0		
1918	92.4	112.2	204.6	1943	160.1	928.6	1,088.7	964.6		
1919	5.7	68.9	74.6	1944	45.6	848.4	894.0	848.4		
1920	2.8	168.3	171.1	1945	14.0	914.8	928.8	808.1		

	lable	III.—Impor	is of Chron	nite into the	United Sta	res			
(Short Tons)									
	1937	1938	1939	1940	1941	1942	1943	1944	1945]
Çuba	104,270	44,273	73,922	58,190	179,944	137,826	310,729	349,059	297,820
Greece	27,533	11,200	12,320	15,726	2,199				• • •
India	26,812	4,537	18,444	36,561	10,910	21,316	2,800	_	
New Caledonia	58,050	31,942	16.082	48,004	90,208	82,677	32,505	34,492	34,391
Philippines	48,886	87,621	80,544	175,354	288,411	30,475	<u>-</u>		
South Africa	78,649	71,602	<i>7</i> 1,550	126,349	189,703	262,259	111,602	40,376	110,415
So. Rhodesia	231,516	116,220	54,599	177,909	269,210	277,272	243,508	187,781	221,855
Turkey	44,118	22,839	18,628	78,491	61,845	119,548	90,778	98,777	70,845
U.S.S.Ř	-		<u>-</u>		-	30,061	99,922	112,315	166,142
Total	620,386	394,335	355,612	736,612	1,115,292	981,607	928,576	848,390	914,765

est" of both countries and pledged maintenance of Mediterranean status quo. ¶ Former U.S. Sec'y of the Treasury Andrew W. Mellon offered his \$19,000,000 art collection to the U.S. as a nucleus for a National Gallery of Art in Washington, to be constructed and endowed by him.

- 3. Representatives of United Automobile Workers of America empowered board of strategy to call strike in 69 General Motors plants in 14 states if company refused to negotiate with union; "sit-down" strikers continued to hold two Flint, Mich., Fisher Body plants in defiance of injunction.
- 6. Pres. Roosevelt, in message to congress on the "state of the Union," declared the constitution adequate to meet modern needs without amendment but called upon courts for a more "enlightened" attitude in interpreting it. U.S. house and senate passed Pittman-McReynolds resolution banning export of arms to Spanish Loyalists or Rebels. Embargo effective Jan. 8.
- 8. Pres. Roosevelt, in his annual budget message to congress, forecast a conditionally balanced budget in the fiscal year 1938 and a completely balanced budget and a halting of the rise of the national debt at \$35,000,000,000 the following fiscal year. ¶ Pres. Roosevelt authorized construction of two 35,000-ton battleships following Japan's refusal to renew naval limitation treaties, which expired
- 10. British gov't forbade enlistment of its citizens in either Loyalist or Rebel Spanish armies and called upon other powers to take similar action.
- 12. Pres. Roosevelt presented to congress his program for administrative reorganization; it called for two additional cabinet departments and for six executive assistants to the president, with all non-policy-determining offices placed under civil service.
- 13. U.S. state dep't warned citizens serving as volunteers with either Spanish army that they faced fines and imprisonment and possible loss of citizenship.

14. Col. Gen. Hermann Goering and Premier Mussolini in Rome conference agreed that, pending effective

nonintervention by all powers in Spanish war, Germany and Italy would rush support to Rebel forces.

- 15. French chamber of deputies unanimously empowered Premier Blum's gov't to bar French volunteers from Spanish armies when other powers agreed to similar measures.
- 19. Howard Hughes established a world distance speed record for land planes by averaging 332 mi. an hour in 2,490-mi. flight from Los Angeles to Newark, chiefly at an altitude of 14,000 ft., in 7 hr., 28 min. and 25 sec. ¶ Foreign Sec'y Anthony Eden solemnly warned Germany in commons speech that it could decide Europe's future; he promised British aid to reich if Germany abandoned idea of national exclusiveness and co-operated fully with other powers in efforts to secure peace.
- 20. Franklin D. Roosevelt took the oath as president of the U.S. for the second time, in the first American inaugural to occur on any date save March 4.
- 21. Foreign Minister Hachiro Arita, speaking before Japanese diet, urged colony-owning nations to adopt free trade policy toward nations lacking raw materials, as an aid to world peace.
- 23. Hirota cabinet resigned in Japan under pressure of army leaders bent on establishing fascist regime; on Feb. 2 Gen. Senjuro Hayashi, army moderate, formed new ministry.
- 24. Premier Léon Blum, in speech at Lyons, expressed France's willingness to help Germany solve its economic problems if assured that reich would co-operate in securing world peace. ¶ Bulgaria and Yugoslavia signed treaty of friendship:
- 25. Atlantic and Gulf coast maritime strike ended after 11 weeks' unsuccessful effort to secure union recognition.
- 27. Seed loan bill, providing for loans by Farm Credit administration not to exceed \$400, passed by U.S. senate without dissenting vote after debate on constitutionality. ¶ League of Nations council settled dispute between France, Syria and Turkey over Alexandretta.
- 28. Canada's "New Deal" legislation on wages and hours, unemployment insurance and marketing regulation, passed in 1934 and 1935 by the Bennett gov't, was declared unconstitutional by the privy council's judicial committee in London, empire court of last resort.
- 29. 12 U.S. navy planes completed hop from San Diego to Honolulu in 21 hr. and 43 min., the greatest non-stop ocean mass flight ever undertaken.
- 30. Chancelor Hitler, in reichstag speech commemorating National Socialism's fourth anniversary, repudiated "war guilt" clause of Versailles treaty, demanded return of former German colonies, and declared that reich was replacing "era of surprises" by one of international cooperation. ¶ Thirteen alleged Trotskyists on trial for treason against the soviet gov't were sentenced to death and executed on Feb. 1; four others, including Karl Radek and Gregory Sokolnikoff, former ambassador to Great Britain, were given prison terms ranging up to 10 years.

FEBRUARY, 1937

- 2. French chamber of deputies, 405 to 186, approved the Blum gov't's defense program, doubling the 19,000,000,000 franc appropriation already voted for 1937, to match reported German 1936-37 defense expenditure of 12,600,000,000 marks.
- 3. The 33rd International Eucharistic congress of the Roman Catholic Church opened in Manila. ¶ Pres. Roosevelt submitted to congress a report of the National Re-

sources committee, accompanied by recommendation for the adoption of a six-year \$5,000,000,000 public works program, including flood-control projects.

- 4. 40,000 seamen returned to work at conclusion of the 98-day \$686,000,000 Pacific coast strike, the most costly in U.S. maritime history; the men tentatively gained higher wages, union control of hiring agencies, better working conditions, and an 8-hr. day.
- 5. Pres. Roosevelt startled the U.S. by sending to congress an unheralded message and bill seeking comprehensive reforms designed to "vitalize the courts." He asked for power to appoint a maximum of six additional supreme court justices—one for each incumbent over 70 years of age who failed to retire—and up to 50 lower court justices.
- 7. William Green, president of the American Federation of Labor, declared that 8,917,000 persons were unemployed in Dec. 1936, despite an increase in the number of employed persons in that month.
- 8. Málaga, Spain, fell to Gen. Francisco Franco's Rebel forces.
- 11. The 44-day automobile strike ended, with General Motors corporation announcing a \$25,000,000 wage increase. Terms of the agreement included: recognition of the United Automobile Workers as bargaining agent for its membership, no discrimination against union members by company, union agreement to call off strike and evacuate plants and start of bargaining concerning working conditions. ¶ Chancellor of Exchequer Neville Chamberlain announced in British house of commons gov't's decision to spend £400,000,000 for rearmament during next five years.
- 12. The German reichsbank was placed under Chancellor Hitler's direct control and the railways under that of the transportation minister, allegedly to end "foreign influences."
- 15. Premier Senjuro Hayashi addressing first session of diet since fall of Hirota cabinet, announced a policy of non-aggression and invited China and the soviet union to establish more cordial relations with Japan. ¶ Chancellor Hitler authorized a free election of new general synod of the German Evangelical Church, recognizing failure of efforts to co-ordinate German Protestantism with the nazi regime.
- 16. London Non-Intervention committee agreed to prohibition against additional foreign volunteers in Spanish war, effective Feb. 20 at midnight; naval patrols and frontier supervision were to enforce ban on entry into Spain of arms and volunteers, effective midnight on March 6.
- 17. Paul V. McNutt, former gov. of Ind., named by Pres. Roosevelt as high commissioner to the Philippines, succeeding Frank Murphy, gov. of Mich.
- 18. Prime Minister Stanley Baldwin, in house of commons, stated Britain's intention to work for new regional security pact in western Europe to replace Locarno treaty.
- 19. Kuomintang party convention decided to terminate 10-year war on Chinese communists in return for latter's agreement to submit to Nanking gov't's supervision.
- 25. Ras Desta Demtu, son-in-law of Emperor Haile Selassie of Ethiopia, was captured and put to death by native troops under Italian command. § U.S. senate, by 58-24 vote, passed joint resolution, already approved by house, extending to June 12, 1940, president's power to negotiate trade pacts with foreign gov'ts.
- 26. Russia retired from international naval patrol of Spanish coast after participating powers conceded its right to take part. ¶ Premier Leon Blum won a 362-211 vote of confidence in French chamber of deputies.

- 2. General steel strike was averted by agreement between the Carnegie-Illinois Steel Corp., and C.I.O. union, providing for union recognition, wage increase and 40-hr. week.
- 3. U.S. senate, by a 63-6 vote, adopted the Pittman resolution providing for strict neutrality and a minimum of discretion for the president in the event of foreign war.
- 4. Pres. Roosevelt, speaking at Washington Democratic "victory dinner," tacitly demanded party's support for his court plan; declared its continuation as majority party depended upon courage immediately to "lead the American people where they want to go."
- 5. Sec'y of State Hull expressed U.S. regret in reply to reich gov't's official protest at New York Mayor La Guardia's reference to Hitler as "brown-shirted fanatic." On March 12 U.S. gov't officially protested subsequent German press attacks upon Mayor La Guardia, the U.S. gov't and American women. ¶"Big navy" advocates in U.S. house of representatives won signal victory when \$526,555,000 naval supply bill was passed after defeat of efforts to cut appropriation.
- 7. Francisco Largo Caballero, Loyalist premier of Spain, emerged from cabinet crisis with united support of all Leftist political factions.
- 8. New wave of sit-down strikes closed all major Detroit plants of Chrysler and Hudson automobile companies, affecting 60,000 workers. A.F. of L. announced drive to organize steel industry in opposition to C.I.O. ¶ The "Mar Cantabrico," laden with aeroplanes and munitions for Spanish Loyalists, was captured by Rebel cruiser in Bay of Biscay.
- 9. Pres. Roosevelt, in nation-wide radio address, declared his judiciary reform plan was designed to protect nation against usurpation of legislative functions by supreme court.
- 12. General Motors and United Automobile Workers of America concluded final agreement for improved working conditions, and for settlement of future grievances without recourse to the sit-down strike.
- 13. Offensive against Madrid by Italian troops in Spanish Rebel service met crushing deseat at Brihuega, near Guadalajara. ¶ French gov't expropriated Creusot works of the Schneider armaments firm, the largest in France.
- 17. 6,000 sit-down strikers defied court injunction ordering evacuation of eight Chrysler plants in Detroit; Gov. Murphy warned that state might have to use force to restore respect for courts and public authorities. Taxi strike in Chicago culminated in violent rioting in the loop district. Five units of U.S. Steel Corp., contracted with C.I.O. unions for year of industrial peace.
- 18. U.S. House adopted the McReynolds resolution giving the president discretionary powers to preserve American neutrality as opposed to mandatory provisions of senate neutrality bill. ¶ Pres. Quezon of Philippine commonwealth in conference with Washington officials asked complete independence for Philippines in 1938 or 1939 instead of on scheduled date in 1946.
- 21. Pope Pius in encyclical read from Berlin pulpits declared church would defeat all efforts to substitute modern ideologies for Christian faith; he attacked nazis for alleged violations of concordat.
- 22. Chief Justice Hughes, with assent of Justices Brandeis and Van Devanter, opposed Pres. Roosevelt's proposal to increase size of supreme court in letter read before senate judiciary committee.
 - 24. French foreign minister warned Britain and Ger-

- many that France would not stand for further direct Italian aid to Spanish rebels in violation of nonintervention agreement of Feb. 20.

 25. Detroit sit-down strikers evacuated Chrysler plants
- 25. Detroit sit-down strikers evacuated Chrysler plants on order from John L. Lewis, C.I.O. chairman, after Walter P. Chrysler on March 24 agreed not to resume production or move machinery during collective bargaining negotiations. ¶ Italy and Yugoslavia signed pact guaranteeing their mutual frontiers and status quo in Adriatic.
- 26. Attacks upon Italy in British house of commons produced new wave of intense anti-British feeling among Italians, spurred on by gov't press.
- 27. WPA report declared national production 20% higher than in 1929 would be required to reduce U.S. unemployment to 1929 level.
- 29. U.S. supreme court, by 5 to 4 decision, upheld Washington State minimum wage law, reversing its decision of previous June on similar New York state law. Court also upheld unanimously Frazier-Lemke farm mortgage moratorium law and sections of Railway Labor act requiring railroads to bargain collectively with their employees.
- 30. Pan-American clipper, surveying 7,000-mi. commercial air route between U.S. and Australasia, arrived at Auckland, New Zealand; stops were made en route at Hawaii, Kingman Reef and American Samoa.
- 31. Japanese diet was dissolved and new elections ordered.

APRIL, 1937

- 1. New constitution for India went into effect with inauguration of provincial autonomy, despite non-co-operation of Indian Nationalists. ¶ General Motors Chevrolet plant in Flint was closed by walkout, raising total of idle automobile workers in Mich. to 120,000. Move in U.S. senate to condemn sit-down strikes provoked sharp debate.
- 2. Two-year agreement between United Mine Workers and operators for wage increase of \$85,000,000 a year to 300,000 miners ended one-day stoppage of coal mining in Appalachian area. ¶ Basque Nationalists were driven back by Rebel drive on Bilbao; Loyalists gained on Madrid and Cordoba fronts; Cordoba was bombed with fleet of new Russian planes.
- 3. Henry G. Yagoda, former acting chief of O.G.P.U., dismissed as soviet commissar of communications for "criminal activities."
- 4. U.S. Federal Reserve board announced it would buy federal securities on open market for account of reserve banks to protect gov't bond market and extend easymoney policy.
- 5. U.S. senate passed Guffey-Vinson Coal bill, after rejecting, 48 to 36, an amendment declaring sit-down strikes "illegal and contrary to public policy."
- 6. Chrysler automobile strike settled by Walter P. Chrysler and John L. Lewis after 30-day tie-up, estimated to have cost \$87,000,000. New sit-downs closed three General Motors plants. Vermont legislature outlawed sit-down strikes.
- 8. U.S. house, 236 to 149, defeated proposed inquiry into sit-down strikes.
- 10. Italian gov't extended partial self-rule to Moslems of Libya; appropriated 85,000,000 lire for naval base at Assab, dominating southern entrance to Red sea.
- 11. Premier Van Zeeland of Belgium won striking victory over Rexists (fascists) in Brussels election, following denunciation of Rexist movement by Cardinal Van Roey, Roman Catholic primate. ¶ London cabinet, modifying



Britain's traditional maritime policy, ordered British merchant vessels bound for Bilbao, Spain, with food not to run Spanish Rebels' blockade.

12. U.S. supreme court, in four 5 to 4 decisions upholding National Labor Relations (Wagner) act, ruled that congress had power to regulate industries organized on national scale even if their products were locally manufactured; labour's right to organize in unions and bargain collectively with large industries was affirmed.

15. U.S. house passed Gavagan anti-lynching bill, 277 to 118, over protests of southern members. ¶ Reversing previous position, Italy expressed willingness to discuss withdrawal of all foreigners fighting on both sides in Spain's civil war.

18. Furthering Chinese unity against Japan, the formerly dissident Kwangsi war lords joined with Nanking leaders in forming new national defense council.

19. International patrol of Spanish coasts to bar foreign war supplies and "volunteers" went into effect at midnight.

20. Pres. Roosevelt in message to congress estimated deficit for fiscal year 1937 at \$2,557,000,000; asked \$1,500,000,000 appropriation for relief and work relief in 1938 fiscal year.

22. Agreement ending strike in General Motors plant at Oshawa, Ont., was signed in Premier Hepburn's office. ¶ Premier Mussolini refused Italian support for restoration of Habsburgs in Austria in conference with Chancellor Schuschnigg at Venice.

23. Riot of cannery strikers in Stockton, Calif., caused injuries to 50 persons. Sit-down strike of 1,200 workers closed Ford Motor Co. plant at Richmond, Calif. ¶ U.S. gov't filed suit in New York for dissolution as a trust of \$174,000,000 Aluminum Co. of America, controlled by former Sec'y of Treasury Mellon and associates.

24. Assembly of 33 civilians took over the civil gov't of Madrid on orders from Premier Largo Caballero. ¶ Joint

London throngs at Buckingham palace waiting, under a mass of umbrellas, for a glimpse of the king and queen after their coronation at Westminster abbey on May 12, 1937

Anglo-French note to Belgian foreign minister freed Belgium of its obligations under Locarno treaty, while continuing the Anglo-French guarantee of Belgian neutrality.

25. Strongly fortified peaks guarding road to Bilbao were captured by Spanish Rebels. On following day Durango, key to Basque capital, and Eibar were occupied and Guernica, ancient Basque capital, was destroyed by terrific 3½-hr. aerial bombardment.

26. U.S. supreme court by 5 to 4 decision nullified 17to 20-year prison sentence passed by Georgia court on Angelo Herndon, Negro communist, as violating guarantees of liberty in 14th amendment.

29. Compromise neutrality bill was rushed through both houses of congress to replace temporary legislation due to expire at midnight of May 1; gave president discretionary powers.

30. Agreement for termination of capitulations in Egypt in 1939 reached at international conference at Montreux, Switzerland.

MAY, 1937

- 1. Chancellor Hitler defied anti-nazi religious groups and Pope in May day speech to German labour; demanded exclusive nazi control over youth.
- 2. U.S. labor dep't estimated 8,241,000 increase in employment since March, 1933, low point of depression.
- 3. A final divorce decree was awarded Mrs. Wallis Warfield Simpson in London.
- 4. Premier Mussolini and Foreign Minister von Neurath of Germany, meeting in Rome, planned closer Italo-German collaboration and development of mid-European bloc of fascist states.
- 6. \$10,000,000 Mellon Institute of Industrial Research dedicated by Andrew W. Mellon at Pittsburgh.

- 8. Mussolini recalled all Italian journalists in London and barred all except three British newspapers from Italy.
- 11. Prime ministers of five dominions presented "loyal addresses" to George VI at Buckingham palace ceremonies.
- 12. George VI was crowned king and emperor in Westminster abbey.
- 14. Imperial conference opened in London. ¶ Henry T. Merrill and John S. Lambie, Jr., completed first commercial round-trip plane flight over North Atlantic, landing at New York city from Liverpool, England, with coronation pictures five days after take-off from New York.
- 15. Loyalist cabinet at Valencia, Spain, resigned; more moderate ministry formed May 17 by Dr. Juan Negnin, Socialist and former finance minister. ¶ Silver jubilee of Christian X of Denmark celebrated at Copenhagen, with kings of Norway and Sweden in attendance.
- 16. Four high officials of Soviet Central Trade Union council arrested for malfeasance and "Trotskyism"; all except one member of council's secretariat dismissed. On May 17 Kremlin decree established supreme military councils to control army commanders.
- 17. U.S. supreme court, 4 to 3, upheld Louisiana tax on chain stores based on total number of stores in each chain system.
- 18. U.S. Supreme Court Justice Willis Van Devanter, known for his conservative and anti-New Deal decisions, resigned, effective June 2; senate judiciary committee, 10 to 8, voted adverse report on Pres. Roosevelt's court reorganization measure.
- 19. Reich press and radio bitterly attacked Cardinal Mundelein of Chicago, who charged that immorality trials of numerous monks in Germany were merely anti-Catholic propaganda.
- 20. 27,000 employees of Jones & Laughlin Steel Corp. voted 2 to 1 in favour of C.I.O. affiliate as their collective bargaining agent. ¶ George VI's coronation review of more than 300 British warships took place at Spithead.
- 21. Soviet aeroplane, landing at north pole, established permanent weather station there in preparation for regular polar air line to United States. On May 22 soviet gov't claimed north pole as its permanent possession. On May 26 three more soviet planes reached pole from Rudolph Island.
- 23. Trotsky announced that his "fourth international" had enrolled thousands of members in 30 countries.
- 24. Social Security act upheld in three decisions of U.S. supreme court. On same day Pres. Roosevelt urged congress to "extend the frontiers of social progress" by passing bill establishing maximum hours and minimum wages and abolishing child labour.
- 26. Egypt was admitted as 59th member of League of Nations.
- 27. Spanish Loyalist White Book, supporting charges of Italian aggression, submitted to League of Nations council with demand for action.
- 28. Neville Chamberlain succeeded Stanley Baldwin as British prime minister; cabinet reorganized.
- 29. Spanish Loyalist planes bombed German pocket battleship "Deutschland" in Iviza harbour, Balearic Islands, killing 23 and wounding 83 members of crew. ¶ Social-Democratic Federation convention at Pittsburgh urged union of Democratic Socialists, organized labour, and Progressives in third party for 1940 presidential campaign.
- 31. German warships bombarded Almeria, Spain, killing 20 or more and wounding 100 persons, in reprisal for Loyalist bombing of battleship "Deutschland." Germany and Italy withdrew from London Non-Intervention com-

mittee and from patrol of Spanish coasts. ¶ Hayashi Cabinet resigned in Japan.

JUNE, 1937

- 3. Duke of Windsor and Mrs. Wallis Warfield (formerly Simpson) were married at Château de Candé, Monts, France, by Mayor of Monts, performing civil ceremony, and by the Rev. R. Anderson Jardine, vicar of St. Paul's church, Darlington, England. ¶ Bills for establishment of seven national planning agencies similar to Tennessee Valley authority introduced in congress. ¶ Prince Funimaro Konoye formed national union cabinet in Japan.
- 8. American Medical ass'n approved birth control as having a definite place in medical practice. ¶ The longest total eclipse of modern times—7 min. 2 sec. at its maximum point, 1,000 mi. S.W. of Honolulu—was studied by scientists at sea, on land and in air.
- 11. U.S. house voted to extend "nuisance" taxes for two years. ¶ Soviet military court condemned to death on charges of treason Marshal Mikhail N. Tukhachevsky, con-

The Duke and Duchess of Windsor after their marriage at the Château de Candé near Tours, France, on June 3, 1937, six months after he had abdicated the throne of England



sidered Red army's ablest strategist and most popular leader, and seven other important generals; sentences executed June 12.

14. U.S. senate judiciary committee's report denounced Roosevelt court reorganization bill as "a needless, futile, and utterly dangerous abandonment of constitutional principle." ¶ Dail Eireann was dissolved after approving Pres. Eamon de Valera's new draft constitution for Irish Free State; general election called for July 1.

16. Soviet union's greatest political purge claimed new victims; Pres. A. G. Cherviakoff of White Russian S.S.R. committed suicide after arrest of 45 colleagues for treason.

19. Gov. Earle of Pa. declared martial law in Johnstown steel strike area; ordered Bethlehem Steel Corp. to close Cambria plant. In Youngstown, O., strikers and police clashed at Republic Steel Corp. plant. ¶ Spanish Rebels captured Bilbao after nine-month siege; Basque Nationalists withdrew to Santander.

21. Blum cabinet resigned when French senate refused

to grant it emergency financial powers.

- 22. Camille Chautemps, Radical Socialist, formed new French Popular Front cabinet including ex-Premier Léon Blum. ¶ Joe Louis, Negro boxer, won world's heavyweight championship by knocking out James J. Braddock, the title holder, in 8th round of scheduled 15-round bout at Comiskey park, Chicago.
- 24. U.S. treasury published names of 67 wealthy taxpayers who "avoided paying their full share of taxes" by transferring personal assets to corporations.
- 25. Youngstown, O., steel mills of Republic Steel Corp. and Youngstown Sheet & Tube Co., reopened under protection of troops after being closed for month by C.I.O. strike.
- 26. Mussolini indicated Italy would back Spanish Insurgents with men and material until they won civil war.
- 29. French gov't closed Paris bourse and suspended gold and foreign exchange payments. On June 30 parliament gave cabinet full powers to Aug. 31 to deal with financial crisis.

JULY, 1937

- 2. Amelia Earhart and her navigator, Fred J. Noonan, were forced down and lost in Pacific ocean near Howland Island in flight from Lae, New Guinea. ¶ Substitute court reorganization bill introduced in U.S. senate by Roosevelt forces; provided for appointment of one supreme court justice each year for each incumbent over 75 years old who refused to retire.
- 6. Spanish Loyalists launched offensive to end siege of Madrid; in succeeding days drove deep salient into Rebel lines northwest of capital.
- 7. Clash between Chinese and Japanese troops near Peiping inaugurated new war. ¶ Partition of Palestine into independent Jewish and Arab states, with Britain retaining mandate over Jerusalem, Bethlehem and corridor to sea proposed in report of royal commission, which had cabinet approval.
- 9. Pres. Roosevelt declared gov't employees have no right to strike and only a limited right to bargain collectively.
- 10. Fighting between Japanese and Chinese troops in north China broke out again despite truce agreement.
- 13. Japanese demanded complete withdrawal of Chinese troops west of Peiping, suppression of anti-Japanese movements, and Chino-Japanese co-operation against communism. ¶ Provisional Pres. David Toro of Bolivia was

ousted in bloodless coup; replaced by Col. German Busch, chief of general staff.

- 14. Three soviet fliers landed plane near San Jacinto, Calif., after record-breaking non-stop 6,262-mi. flight from Moscow via north pole in 62 hr. 2 min.
- 18. Spanish Rebel counter-attack upon Brunete checked Loyalist offensive west of Madrid.
- 19. Foreign Sec'y Eden warned Mussolini Britain would fight to defend interests in Mediterranean sea and along route to India.
- 21. Senator Alben W. Barkley of Ky. elected Democratic leader of U.S. senate over Senator Pat Harrison of Miss. by 38 votes to 37.
- 22. British house of commons voted to postpone action on partition of Palestine pending discussion before League of Nations. ¶ Roosevelt court bill was killed, 70 to 20, in U.S. senate; judiciary committee instructed to draft another bill for "procedural reforms in lower courts."
- 23. Parliament liberalized Britain's divorce laws; desertion, cruelty and incurable insanity as well as adultery made grounds for action.
- 26. Japanese detachment entering Peiping gate was attacked by Chinese, suffering numerous casualties; ultimatum demanding withdrawal from Tientsin-Peiping area presented to Chinese.
- 28. Japanese troops captured Nanyuan and opened drive on Peiping, after wiping out Chinese regiment at Tungchow and occupying American missionary school there. ¶ Bomb explosion and frontier raids by Irish Nationalists marked post-coronation visit of King George VI and Queen Elizabeth to Belfast, Northern Ireland.
- 31. Japanese cleared Chinese troops from Trentsin-Peiping area after sharp fighting.

AUGUST, 1937

- 1. French liner "Normandie" established new westward transatlantic crossing record of 3 days 23 hr. and 2 min. from Bishop's Rock, England, to Ambrose Light, New York harbour; on return trip week later, it set new west east record of 94 hr. 7 min.
- 2. Prime Minister Chamberlain received friendly reply from Mussolini to his letter seeking Anglo-Italian harmony; Rome announced early termination of journalistic boycott of Britain.
- 4. U.S. house passed, 205 to o, Gold Star mothers' pension bill adding \$8,952,000 annually to war pensions' cost
- 5. Harold S. Vanderbilt's yacht "Ranger" retained the America's cup for the New York Yacht (lub by defeating T. O. M. Sopwith's "Endeavour II," the British challenger, in fourth successive race of series off Newport, R.I.
- 6. U.S. senate passed \$700,000,000 Wagner-Steagall housing bill, 64 to 16, with amendment restricting cost of housing to \$1,000 a room. ¶ Soviet gov't agreed to buy \$40,000,000 worth of goods from U.S. in ensuing year in return for lower tariff on U.S.S.R. coal and other concessions.
- 7. U.S. state dep't announced that 37 gov'ts had formally agreed with Sec'y Hull's statement of July 16 that welfare of all countries demanded observance of international treaties and obligations, lowering of commercial barriers and reduction of armaments.
- 8. German police arrested 115 supporters of the Rev Martin Niemoeller, imprisoned anti-nazi Protestant leader, in first public anti-nazi demonstration in Berlin.
- 9. Strike of 30,000 silk and rayon textile workers marked drive of Textile Workers Organizing committee, C.I.() agency, to unionize these industries.
- 11. Conservative Democrats combined with Republicans in U.S. congress to block Black-Connerv wages and hours

bill and anti-lynching measure. ¶ Moscow received news of execution in eastern Siberia of 72 more alleged spysaboteurs in Japanese pay, bringing total executed in that region to 310 in three months.

13. Six soviet aviators led by Sigismund Levanevsky, "the soviet Lindbergh," who took off in one plane from Moscow on transpolar flight to U.S. Aug. 12, were lost in the arctic.

15. Prov. Pres. Rafael Franco of Paraguay resigned following army coup d'état. Dr. Felix Paiva, his successor, ended Franco's experiment in state socialism and pledged neturn to constitutional gov't.

16. Japanese launched land, sea and air attack on Chinese forces at Shanghai; Nanking and other Yangtze valley cities bombed; evacuation of American women and children from Shanghai ordered. ¶ U.S. house unanimously passed bill to plug income tax loopholes.

.17. U.S. senate confirmed nomination of Scn. Hugo L. Black of Ala. as associate justice of supreme court, 63 to 16.

19. Harry L. Hopkins, WPA administrator, reported that 1,500,000 workers had left WPA for private employment in 18 months; 1,527,450 were still on rolls.

23. Japan tightened hold over private capital to finance

war in China. Sec'y of State Hull announced middle-of-

road policy in far east based on Washington treaties and peace pacts.

24. Spanish Insurgents captured Torrelavega, key to Santander; on following day Santander fell, ending Basque

25. Pres. Roosevelt, signing compromise judiciary reorganization bill, said he would continue fight for thoroughgoing reform of judicial processes.

26. Japan established blockade of Chinese shipping along 800-mi. stretch of coast.

29. China and soviet union signed nonaggression pact. British gov't in note to Japan demanded "fullest measure of redress" for shooting of British ambassador to China on Aug. 26.

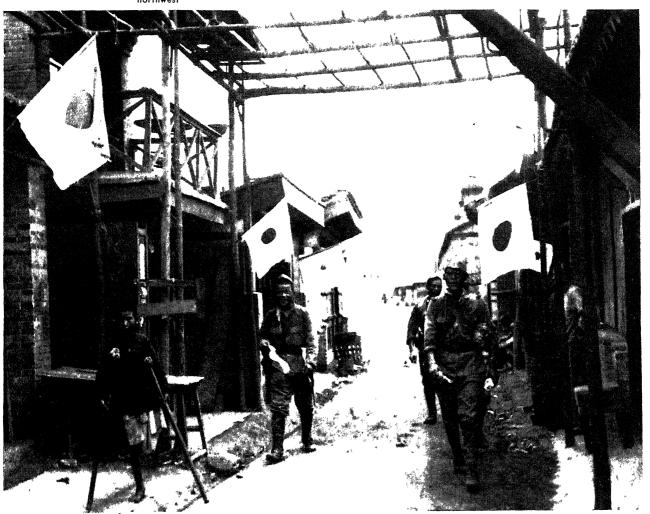
30. Dollar liner "President Hoover" was mistaken for Japanese ship and bombed by Chinese airmen while awaiting refugees off mouth of Yangtze; seven members of crew wounded, one mortally. U.S. gov't warned its merchant vessels to avoid Shanghai. China offered U.S. formal apology on Aug. 31.

31. National Labor Relations board defied Federal District court ruling that A.F. of L. union had valid closed shop contract with Pennsylvania firm and ordered election to determine collective bargaining agent.

SEPTEMBER, 1937

2. Roman Catholic prelates of Insurgent Spain, with

Undeclared war between China and Japan began on July 7, 1937, with a skirmish on the outskirts of Peiping. Two months later these Japanese troops were marching through Nankow in a drive to the northwest



Vatican approval, issued pastoral letter defending Gen. Francisco Franco's military revolt against Spanish gov't as legitimate self-defense.

- 4. Chinese counteroffensive in Shanghai area drove invaders back and forced eight Japanese troopships to withdraw down Whangpoo river. U.S., British and French consul generals unsuccessfully requested Chinese and Japanese to withdraw troops from vicinity of International Settlement.
- 5. Japanese opened offensive on Shanghai front; extended blockade of Chinese coast. Pres. Roosevelt warned 7.780 Americans in China that they stayed at their own risk. § Dr. Roberto M. Ortiz, candidate of conservative coalition, won Argentine presidential election.
- 7. Hitler's proclamation to opening session of annual nazi party congress at Nürnberg hailed "community of will" between Germany and Italy; pledged support of German-Japanese anti-Communist pact.

10. Diplomatic corps at Berlin, with exception of papal, Russian, Norwegian and Peruvian envoys, attended annual nazi party congress at Nuernberg for first time.

- 12. Pittsburgh Post-Gazette published first of series of articles charging that U.S. Supreme Court Justice Hugo L. Black was member of Ku Klux Klan. ¶ U.S. treasury temporarily abandoned "sterilizing" of gold to maintain administration's "easy money" policy. Stock quotations continued to decline on New York market.
- 13. China invoked Articles X, XI and XVII of League Covenant against Japan as League assembly opened at Geneva; the Aga Khan, India's delegate, was elected president.
- 14. Pres. Roosevelt forbade gov't-owned merchant ships to transport arms and munitions to China and Japan; said other vessels under American flag would engage in such trade at their own risk. § Nyon anti-piracy agreement signed by Britain, France, Russia and six Mediterranean powers. Italy demanded parity in patrolling sea as condition of its adherence.
- 15. French franc depreciated to lowest point in 11 years when gov't withdrew support of exchange stabilization fund.
- 16. League council decided to refer China's appeal against Japan to Far Eastern Advisory committee set up during Manchurian crisis of 1933 with U.S. as nonvoting member.
- 17. Nanking gov't protested U.S. embargo on munitions and arms shipments as favouring Japan and unfair to China. § Britain and France announced withdrawal from international naval patrol of Spanish coast established by Non-Intervention committee.
- 20. Sec'y of State Hull, speaking at annual American Legion convention in New York city, declared U.S. could stay out of war only by following middle course between isolation and complete entanglement in world affairs.
- 21. 2,000,000 Czechoslovaks attended funeral of former President Masaryk in Prague.
- 22. Ignoring British and American protests, 50 Japanese planes twice raided Nanking, killing and wounding 200 civilians; air raid on Canton was repulsed. U.S. sent stronger protest note to Tokyo.
- 24. Japanese captured Paoting, breaking first Chinese defense line in North China. British gov't ordered strong protest against bombing of non-combatants in Chinese cities. Adm. Harry E. Yarnell of U.S. Asiatic fleet announced his ships would remain in Chinese waters to protect Americans.

- 25. Premier Mussolini, arriving in Munich, began conferences with Hitler. On Sept. 26 the two dictators reviewed German troops in Mecklenburg. On Sept. 27 they received tumultuous reception in Berlin. On Sept. 28 they spoke to great radio audience, Mussolini predicting a fascist Europe and Hitler stressing Italo-German "community of views and action."
- 28. Pres. Roosevelt in speech at Bonneville dam, Ore., promised balanced budget for 1938-39, and defended his program of national planning. He set in motion first generator of \$75,000,000 project.
- 29. Washington published note from Tokyo declaring Japan would continue its course in China despite American protests.

OCTOBER, 1937

- 2. Joint Anglo-French note demanded withdrawal of Italian troops from Spain; 32 member nations of League assembly voted to end nonintervention policy in Spain.
- 5. Pres. Roosevelt, in Chicago speech, said civilization was threatened by "reign of terror and international law-lessness"; pledged "concerted effort" with other peace-loving peoples to "quarantine" aggressor nations. ¶ League's Far Eastern Advisory committee unanimously condemned Japan as treaty-breaking aggressor and expressed its "moral support" of China. ¶ Italians disclosed that additional troops had been sent to aid Spanish Insurgents; Premier Mussolini's son, Bruno, went with crack bombing squadron.
- 6. U.S. state dep't formally condemned Japan's actions in China as violations of Nine-Power treaty and Kellogg-Briand pact. League of Nations assembly authorized League members signatory to Nine-Power treaty to consult with U.S. and other interested powers with view to ending Sino-Japanese conflict.
- 9. Italy rejected Anglo-French invitation to three-power conference on withdrawal of "volunteers" from Spain; Japan was notified Italy supported her policy in China.
- 10. Winning four games out of five from New York Giants (National league), the New York Yankees (American league) won 1937 world's baseball championship.
- 13. Germany formally pledged Belgium to respect its inviolability and territorial integrity unless Belgium joined in military action against reich.
- 14. A.F. of L. convention approved peace negotiations with C.I.O.; re-elected William Green as president. On Oct. 15, C.I.O. named committee to arrange for peace conference with A.F. of L.
- 16. U.S. gov't formally accepted Belgium's invitation to Nine-Power treaty conference at Brussels on far eastern situation.
- 18. Chinese air fleet bombed Japanese forces in Shanghai severely in series of raids; Japanese were reported advancing in Hopeh and Shantung provinces but blocked in Shansi. ¶ Pres. Roosevelt predicted federal deficit of \$695,000,000 in 1937–38, in contrast to his forecast of Jan. 8, 1937, that budget would be balanced.
- 20. Italy and Germany agreed in London Non-Intervention committee to postpone issue of belligerent rights for Spanish Insurgents until after "token withdrawals" of foreign "volunteers" from Spain.
- 21. Pres. Roosevelt named his son and secretary, James Roosevelt, as co-ordinator of executive activities of 18 independent emergency government agencies.
- 22. Interstate Commerce commission authorized U.S. railways to increase freight rates on a limited list of basic commodities.
 - 23. Prov. Pres. Federico Paez of Ecuador resigned; suc-

- 24. Miss Jean Batten of New Zealand established new solo air record of 5 days 18 hr. and 15 min. from Darwin, Australia, to Lympne, Kent, England.
- 25. Premier Paul Van Zeeland of Belgium and his cabinet resigned to answer charges of irregularities in administration of National bank.
- 27. Japanese cracked Chinese defense line at Shanghai after two months of hard fighting and captured Kiangwan, Chapei and other areas of city; Chinese retreated in order to new line. Japan rejected invitation to Nine-Power conference at Brussels.
- 28. Mussolini pledged support of Germany's colonial claims and of campaign to drive communism from Spain and Europe in speech celebrating 15th anniversary of fascist march on Rome.
- 29. Germany declined invitation to nine-power treaty parley at Brussels.

NOVEMBER, 1937

- 3. Representatives of 14 nations including U.S. convened at Brussels under Nine-Power treaty to discuss means of ending Sino-Japanese conflict. § Baltimore Federation of Labor passed resolution protesting projected visit of duke and duchess of Windsor to U.S. to study labour conditions. After similar protests from other labour groups, the duke and duchess on Nov. 5 cancelled arrangements for trip.
- 4. Pres. Cárdenas nationalized 2,000,000 ac. of oil lands in southern Mexico, including 350,000 ac. under lease to Standard Oil Co. subsidiary.
- 6. Italy signed German-Japanese anti-Communist pact of Nov. 25, 1936.
- 8. Russia warned Italy that it considered latter's adherence to anti-Communist pact an unfriendly act.
- 9. Main body of Chinese retreated from Shanghai before Japanese pincer movement, ending struggle for city begun Aug. 13; in north China Japanese captured Taiyuan, capital of Shansi.
- 10. Pres. Getulio Vargas dissolved federal congress and state assemblies of Brazil; issued new constitution establishing corporative state.
- 12. Japan declined second bid to discuss far eastern peace with Brussels conference powers.
- 15. Special session of congress convened at Pres. Roosevelt's call to legislate on agriculture, wages and hours, governmental reorganization, and regional planning. President's message suggested limited revision of tax laws to aid business. ¶ Brussels conference on Sino-Japanese conflict adopted resolution declaring Japan "out of step with the world" and urging her to discuss situation with other signatories of Nine-Power pact.
- 18. Anglo-American agreement to negotiate reciprocal trade pact announced after year of preliminary negotiation.
- 19. French chamber of deputies voted confidence in Chautemps ministry, 399 to 160, after revelation of revolutionary plot by Les Cagoulards, anti-Popular Front hooded secret society. ¶ Capt. George E. T. Eyston of England set new world land speed record of 311.42 m.p.h. in auto racer on Bonneville Salt Flats, Utah.
- 20. Amadeo, duke of Aosta and cousin of King Victor Emmanuel, appointed viceroy of Ethiopia succeeding Marshal Rodolfo Graziani; Mussolini added ministry for Italian Africa to his four other cabinet portfolios.
- 21. Chancellor Hitler, in speech at Augsburg, declared Germany must become "a great empire"; said he did not expect settlement of colonial claims for five to six years.

- 24. Brussels conference "recessed" indefinitely after ignoring Chinese pleas for "positive and concrete measures" against Japan.
- 26. Walther Funk, reich press chief, succeeded Dr. Hjalmar Schacht as German minister of economics.
- 27. Japanese in Shanghai took over Chinese postal, customs and communications agencies. U.S., Britain and France immediately protested against Japanese customs control. ¶ Chemical creation of life from sexless egg fragments described before American Philosophical society at Philadelphia by Dr. Ethel Browne Harvey of Princeton.
- 28. Spanish Insurgents proclaimed blockade of all Loyalist ports in defiance of London Non-Intervention committee.

DECEMBER, 1937

- 1. U.S. gov't filed antitrust suits in New York against Western Union Telegraph Co., Postal Telegraph and Cable Corp., and 36 subsidiaries of latter concern.
- 2. Maj. Gen. Viscount Gort appointed chief of imperial general staff in drastic reorganization of British army council by War Minister Leslie Hore-Belisha; all elderly members eliminated.
- 3. Japanese occupied 30 square blocks of International Settlement after Chinese threw bomb into "victory parade" of 5,000 Japanese troops through Shanghai; they withdrew from American defense sector under threat of forceful action by U.S. marines. ¶ Pres. Vargas decreed dissolution of all Brazilian political parties, including fascist Integralistas.
- 5. Japanese captured Kuyung, key defense position 25 mi. from Nanking; they broke through 300,000 Chinese troops defending capital and reached outskirts of city Dec. 6.
- 6. U.S. supreme court ruled, 5 to 4, that West Virginia and Washington could legally tax gross incomes of contractors on federal projects; decision considered blow at long-standing immunity of federal agencies from state taxation and vice versa.
- 7. Resignation of William E. Dodd as U.S. ambassador to Germany revealed at Washington.
- 8. Joseph P. Kennedy, chairman of U.S. Maritime commission, selected as ambassador to Great Britain, succeeding Robert W. Bingham, who resigned because of ill health
- 9. WPA employment for 350,000 additional workers announced by Administrator Harry L. Hopkins to offset increasing unemployment in private industry. ¶ Japanese announced capture of Wuhu; on Dec. 10 they gained foothold within Nanking's walls.
- 10. U.S. house passed Farm bill for compulsory control of crop surpluses, 267 to 130.
- 11. Mussolini announced Italy's withdrawal from League of Nations.
- 12. Supreme soviet of U.S.S.R. was elected in first vote under new "democratic" constitution; ticket headed by Joseph Stalin was unopposed. ¶ Japanese naval aviators bombed and machine-gunned U.S. gunboat "Panay," which was sunk, and three Standard Oil vessels on Yangtze river 25 mi. above Nanking. Of 76 persons on "Panay," 1 Chinese was killed, 2 American sailors and Italian news correspondent were mortally wounded, and 17 others injured. Capt. C. H. Carlson, American skipper of Standard Oil steamer "Meian," was killed. Pres. Roosevelt on Dec. 13 demanded full expressions of regret, full compensation, and guarantees against repetition of such attacks. London

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gov't likewise protested Japanese shelling of British gunboats and merchant ships on Yangtze.

13. U.S. supreme court, 6 to 3, upheld treasury's right to call gold-clause Liberty bond loans for redemption in currency without paying interest to original date of maturity.

14. Pro-Japanese provisional gov't to rule conquered Chinese provinces established at Peiping, which was renamed Peking. § U.S. senate rejected administration-supported measure to restrict farm bill expenditures to \$500,000,000 annually.

15. Ten-point recovery program calling for repudiation of most of New Deal drafted by group of conservative Democratic and Republican senators for congressional

action.

16. Republican National committee named Glenn Frank, former pres. of Univ. of Wisconsin, as chairman of committee to draft party program.

17. U.S. house shelved wages and hours bill, 216 to 198, after days of bitter debate. Senate passed farm bill, 59 to 20.

18. Spanish Loyalist troops encircled Teruel, key Insurgent position in northeastern Spain, in three-day offensive declared greatest Loyalist victory of civil war. Teruel was occupied Dec. 21 after six-day struggle in streets but several thousand Insurgents continued to hold out in seminary and Bank of Spain building. ¶ U.S. house voted 324 to 24 to liberalize national housing act in line with Pres. Roosevelt's recommendations.

19. Soviet gov't announced execution for high treason of Leo M. Karakhan, former vice-commissar of foreign affairs, and seven other important soviet officials. ¶ Completion of 1,800-mi. soviet military railway paralleling Trans-Siberian Ry. from Lake Baikal to Khabarovsk near Pacific reported.

20. Sec'y of State Hull announced U.S. would keep its existing military and naval forces in China. ¶ U.S. supreme court ruled, 7 to 2, that information obtained by tapping telephone wires could not be used as evidence in criminal trials.

21. U.S. senate passed housing bill, 60 to 4. Special session of congress adjourned without final action on any one of four major measures requested by Pres. Roosevelt. ¶ A.F. of L.-C.I.O. peace negotiations ended in failure.

23. National Labor Relations board declared Ford Motor Co. guilty of violating National Labor Relations act.

24. Japanese laid siege to Tsinan, capital of Shantung province; it capitulated Dec. 27, leaving Japan in control of seven provincial capitals in addition to Nanking. Chinese razed Japanese cotton mills and other valuable properties in Tsingtao in advance of Japanese occupation. Japan in formal reply to U.S. protest on "Panay" bombing declared the attack unintentional, but apologized and promised compensation and guarantees against repetition. On Dec. 25 Sec'y of State Hull accepted Japanese note as satisfactory, conditional upon future observance of U.S. treaty rights.

26. Ass't Attorney-General Robert H. Jackson fired opening gun of administration campaign against business monopolies in Washington radio address; attributed business recession to high monopoly prices.

28. Expressing "growing concern" at world events. Pres. Roosevelt indicated prospect of enlarged naval building program in letter to House Appropriations committee chairman. ¶ Octavian Goga, anti-Semitic, pro-German fascist leader, named premier of Rumania by King Carol after defeat of Tatarescu gov't in elections of Dec. 20.

30. Pres. Roosevelt reported directing administration drive against monopolies in effort to reduce building costs and promote gov't-assisted private housing boom; Sec'y of Interior Ickes in radio speech declared antitrust campaign was death-struggle with plutocracy.

JANUARY, 1938

1. Preliminary U.S. unemployment census returns showed from 7,800,000 to 10,000,000 persons jobless in mid-November; 7,822,912 unemployed registered voluntarily.

2. U.S. Social Security board announced registration of 36,000,000 wage earners under old-age insurance program.

3. Gen. Chiang Kai-shek resigned as premier of China to devote entire time to prosecution of war against Japan; Dr. H. H. Kung succeeded him. ¶ Pres. Roosevelt's message to congress asked co-operation of all economic groups with gov't and urged agricultural and wages and hours legislation to raise national income. ¶ Two U.S. supreme court decisions unanimously upheld legality of PWA grants and loans to municipal electric plants competing with private power systems.

5. Pres. Roosevelt's annual budget message predicted \$950,000,000 deficit in 1938-39; \$7,000,000,000 budget included \$1,000,000,000 for national defense. ¶ George Sutherland, conservative 75-year-old associate justice of U.S. supreme court, resigned, effective Jan. 18.

7. Italy announced naval construction program calling for two 35,000-ton battleships, 12 destroyers and many submarines. § 2,000 survivors of Insurgent garrison trapped in Teruel since Dec. 18, 1937, surrendered to Spanish Loyalists.

10. U.S. house, 209 to 188, barred consideration of Ludlow amendment proposing national referendum on war except in case of invasion. ¶ Japanese occupied Tsingtao, chief port of Shantung province.

11. Imperial council convened in Tokyo for first time since 1914 to decide Japan's future policy in China.

13. Church of England commission approved evolutionary theory of creation and dealt with other doctrinal controversies in report issued after 14-year study. ¶ Federal Judge Fred L. Wham in East St. Louis, Ill., assessed \$117.000 damages against 66 union members for losses caused coal mine by unlawful acts during strike.

14. Chautemps cabinet resigned in France following split in Popular Front. On Jan. 18 Chautemps formed new Radical Socialist ministry with Socialist support.

15. Pres. Roosevelt appointed Solicitor-General Stanlev Reed as associate justice of U.S. supreme court to succeed Justice Sutherland, resigned.

16. Japan announced it would withdraw recognition from Gen. Chiang Kai-shek's Nationalist gov't in China, extend recognition to new pro-Japanese administrations, and respect foreign interests; opened negotiations for \$50,000,000 credit in U.S.

19. Pres. Cárdenas of Mexico decreed drastic tariff increases on most imports from U.S. in move toward autarchy.

21. Federal court at Chattanooga, Tenn., ruled that TVA's competition with private power companies was lawful

22. Foreign Minister Koki Hirota told Japanese diet China must collaborate against soviet union in Japanese-controlled bloc of far eastern nations; pledged Japan to respect foreign economic and cultural interests in China. ¶ Madison, Wis., federal jury convicted 16 oil companies and 30 executives of criminal conspiracy to raise and fix gasoline prices.

- 24. Securities and Exchange commission barred short selling of securities on stock exchanges in declining market, effective Feb. 8.
- 27. U.S. gov't made new protest against Japanese violations of American rights in China; official of U.S. embassy at Nanking slapped by Japanese soldier.
- 28. Pres. Roosevelt asked congress for additional national defense expenditures estimated at \$800,000,000 to match "increasing armaments of other nations." ¶ Arrest of 100 Opposition leaders by Greek dictator, Premier John Metaxas, reported.
- 30. Spanish Rebel bombers killed hundreds of civilians in two air raids on Barcelona.
- 31. U.S. supreme court ruled unanimously that federal district courts lacked authority to enjoin hearings by National Labor Relations board.

FEBRUARY, 1938

- 1. Spanish Cortes approved Negrin (Loyalist) gov't's uncompromising war policy at semi-annual meeting in Montserrat monastery near Barcelona.
- 2. Conference of 1,000 "small" businessmen to aid Pres. Roosevelt in formulating recovery program opened tumultuously in Washington; on Feb. 3 it demanded repeal or modification of many New Deal measures.
- 3. France joined Britain in new antisubmarine naval measures in Mediterranean.
- 4. Chancellor Hitler ended week's crisis caused by conflict between reich army and nazi party by reorganizing cabinet and army high command and assuming "personal and direct command over all armed forces." ¶ 100,000 Detroit workers and unemployed staged mass demonstration protesting lay-offs; demanded "adequate" relief, debt moratorium and rent reductions. ¶ Pres. Roosevelt signed housing bill designed to promote widespread private building of small homes.
- 7. A.F. of L. announced revocation of charters of United Mine Workers of America and two other C.I.O. unions. § Sedition trial of Rev. Martin Niemoeller, anti-nazi German Protestant leader, opened in Berlin with newspapermen and general public excluded.
- 8. Sec'y of State Hull formally denied rumours that U.S. had secret understanding with Britain or other powers for joint foreign policy or naval action.
- 9. U.S. Steel Corp. renewed indefinitely its collective bargaining contract with C.I.O.
- 10. Pres. Roosevelt asked congress for additional \$250,000,000 for unemployment relief through June 30; he estimated increase in unemployment at 3,000,000 in preceding three months. ¶ King Carol of Rumania forced resignation of anti-Semitic Goga gov't and proclaimed virtual dictatorship; new cabinet formed by Patriarch Miron Cristea, head of Orthodox Church.
- 11. Injunction against price fixing by National Bituminous Coal commission granted by U.S. court of appeals for District of Columbia.
- 12. Japanese note to U.S., Britain, and France refused information as to Nippon's naval plans.
- 14. U.S. senate, 56 to 31, approved crop control bill passed by house, 263 to 135, on Feb. 9. It was signed by Pres. Roosevelt Feb. 16. ¶ Britain's \$55,000,000 naval base at Singapore was officially opened.
- 16. Austrian cabinet was reorganized, giving pro-nazis key posts; general amnesty for nazi and other political prisoners proclaimed.
- 18. Pres. Roosevelt declared "balance" of commodity prices and increased income and employment through "balanced" expansion of production was administration's

- immediate objective. He ordered Reconstruction Finance Corp. to resume lending as stimulus to business. ¶ Pres. Roosevelt appointed Rear Adm. Emory S. Land chairman of Maritime commission, succeeding Joseph P. Kennedy.
- 20. Chancellor Hitler in anxiously awaited speech before German reichstag demanded right of self-determination for "10,000,000 Germans" in Austria and Czechoslovakia and return of former German colonies. ¶ Foreign Sec'y Anthony Eden resigned from British cabinet in protest at Prime Minister Chamberlain's methods in seeking settlement with Italy and Germany. ¶ Dr. Roberto M. Ortiz inaugurated pres. of Argentina.
- 21. U.S. senate voted, 58 to 22, to lay aside anti-lynching bill, ending 30-day filibuster by southern members.
- 22. British house of commons voted approval, 330 to 168, of Prime Minister Chamberlain's "realistic" foreign policy of appeasing Hitler and Mussolini. ¶ Spanish Loyalists evacuated Teruel to Insurgents after hard fighting.
- 23. Chinese aeroplanes bombed Taihoku and other Formosan towns, killing 8 and wounding 29 persons; in central China, Japan pressed offensive against Lung-Hai railway along 300-mi. front.
- 24. Chancellor Schuschnigg pledged unwavering defense of Austria's independence in diet speech; declared Hitler guaranteed Austria's full sovereignty at Berchtesgaden conference Feb. 12. ¶ Germany followed Italy in accepting British formula for withdrawal of foreigners fighting with Spanish Insurgents and Loyalists.
- 25. Viscount Halifax succeeded Anthony Eden as British foreign secretary; Eden in speech to Leamington constituents declined to lead Conservative revolt against gov't.
- 26. Breakup of European "spy ring" through arrest in New York of two U.S. soldiers and German woman announced by Bureau of Investigation. ¶ French chamber of deputies, 439 to 2, upheld Chautemps gov't's foreign policy, including pledge to defend Czechoslovakia and oppose German hegemony in Danube valley.
- 27. AAA established 1938 payment of 12 cents per bushel for wheat growers co-operating with Sec'y Wallace's program.

MARCH, 1938

- 1. Inter-American League of Nations proposed jointly by Colombia and Dominican Republic. ¶ Chinese aeronautical commission reported 325 Japanese planes destroyed Aug. 13 to Dec. 31, 1937. ¶ U.S., Britain and France began secret conference to nullify limitations on size of battleships.
- 3. Great Britain allotted army £106,500,000 of £343,250,000 appropriated for defense during ensuing fiscal year; navy estimate, £123,707,000. ¶ Glenn Cunningham ran one mile in 4:04.4, fastest time on record.
- 4. Canadian supreme court declared social credit plan of Premier Aberhart of Alberta unconstitutional.
- 5. U.S. proclaimed sovereignty over Canton and Enderbury islands in mid-Pacific and over antarctic lands first visited by Americans. ¶ Congress refused Pres. Roosevelt's request for authority to veto individual items in appropriation bills.
- 8. I.C.C. granted 5 to 10% increase in freight rates to raise railway revenues \$175,000,000 to \$270,000,000. Carriers had asked rise of 15%.
- 9. Chancellor Schuschnigg of Austria suddenly announced Austrian plebiscite March 13 to vote on union with Germany. ¶ Insurgents began huge offensive on 70-mi. front in southeast Spain.



- 10. Pres. Roosevelt sent to congress five-year, \$2,124,-867,000 plan for flood control and conservation. ¶ Camille Chautemps resigned as premier of France.
- 11. Disorders broke out in Austrian cities in nazi protest at surprise plebiscite for March 13. German troops entered Austria. Chancellor Schuschnigg resigned, and was succeeded by pro-nazi Dr. Arthur Seyss-Inquart, former Austrian minister of interior.
 - 12. Chancellor Hitler entered Austria.
- 13. Léon Blum, French premier, formed his second Popular Front cabinet.
- 15. In Vienna speech Chancellor Hitler announced union of Austria with Germany and appointed Dr. Arthur Seyss-Inquart governor. ¶ Thousands of men and women responded to appeal of Sir Samuel Hoare, British home secretary, for 1,000,000 volunteers for air-raid defense. Gov't proposed £102,720,000 for air defense in 1938. ¶ Karl Hermann Frank, vice-president of Sudeten German party in Czechoslovakia, demanded that Czechs accede to Germany's demands for 3,500,000 Germans in Czechoslovakia. ¶ Pres. Manuel Quezon abandoned his 30-year demand for immediate Philippine freedom in favour of indefinite retention by U.S., as previously suggested by Paul V. McNutt, U.S. high commissioner to Philippines.
- 17. Mexican gov't expropriated \$450,000,000 properties of 17 American and British oil companies in Mexico. ¶ Polish ultimatum to Lithuania demanded immediate resumption of diplomatic and trade relations under penalty of invasion. ¶ Litvinov promised Russian help to Czechoslovakia if that country were attacked. ¶ Pres. Roosevelt authorized contracts for 3,077 new homes in 12 cities at a cost of \$16,836,000 and with monthly rental rates from \$2.75 to \$4.25 a room.
- 18. U.S. House voted to include a minimum of 3,000 aeroplanes in \$1,120,000,000 U.S. naval construction bill.
- 19. Ontario supreme court awarded \$500,000 bequest of Charles Vance Millar equally to four mothers, each with nine children, in ten-year "stork derby." ¶ Lithuania accepted Polish ultimatum and ended Baltic war scare. ¶ German-Austrian union recognized by U.S.

- Nazi troops parading through Vienna shortly after the occupation of Austria on March II, 1938, marking the first step in Germany's territorial expansion
- 20. Japanese reported capture of Hanchwang. Fatalities in seven-day battle placed at 30,000 Chinese and Japanese.
- 21. Dr. Arthur E. Morgan, TVA chairman, refused Pres. Roosevelt's demand that he retract charges or resign. ¶ House adopted \$1,121,546,000 naval construction bill. ¶ Thurman W. Arnold took office as assistant U.S. attorney general to enforce antitrust laws, succeeding Robert H. Jackson, then U.S. solicitor general.
- 22. Sale of U.S. noninflammable helium gas for balloon inflation delayed for satisfactory guarantees from Germany that gas would not be used for war purposes. ¶ Premier Konoye announced plan for Japanese-sponsored gov't for central China. ¶ Pres. Roosevelt dismissed Dr. Arthur F. Morgan from TVA chairmanship. ¶ Barcelona, Spain, war ministry reported 60,000 Italian troops in Spanish Insurgent armies. ¶ Chinese reported recapture of Hanchwang. ¶ Rockefeller foundation announced development of new vaccine to prevent yellow fever.
- 23. Osservatore Romano, semiofficial organ of the Vatican, announced Pope Pius had twice urged Gen. Franco, Spanish Insurgent, to cease bombing open cities.
- 24. U.S. formally asked 29 nations to co-operate in emigration of political refugees from Germany and Austria.
- 25. U.S. Senate voted TVA investigation. ¶ Japan accepted U.S. demand to stop salmon fishing in Alaskan waters.
- 26. German Field Marshal Goering, in speech in Vienna, warned Jews to leave Austria. § Paris Communist party threatened nation-wide strike in retaliation for French senate opposition to Socialist Premier Blum.
- 27. U.S. treasury suspended monthly purchases of 5,000,000 ounces of Mexican gov't silver. ¶ Spanish Insurgent drive entered Catalonia. ¶ Sudeten German mass meetings demanded autonomy for 3,500,000 German minority in Czechoslovakia. ¶ Senate adopted administration bill giving Pres. Roosevelt wide power in reorganizing executive branches of gov't.

- 28. Loyalist premier, Juan Negrin, called for 100,000 volunteers to resist Insurgent drive in Catalonia.
- 29. U.S., Britain, and France reported agreed to raise battleship tonnage limit from 35,000 to 41,000 tons. ¶ House voted \$448,116,280 for U.S. army.
- 30. Mussolini told Italian senate Italy could mobilize 9,000,000 amply equipped soldiers. ¶ Prince Franz I, 84, retired, to be succeeded by his heir, Prince Franz Joseph, 32, as ruler of independent principality of Liechtenstein.
- 31. Britain ended fiscal year with budget almost balanced, expenditures of £908,667,000 exceeding revenues by only £28,786,000.

APRIL, 1938

- 1. The Vatican repudiated Austrian bishops' advice to Austrian voters to support the plebiscite for German-Austrian union.
- 2. Great Britain formally recognized German seizure of Austria.
- 4. Students of Rensselaer Polytechnic institute, Troy, N.Y., cornered city's supply of pennies in protest against "25% of hidden taxes in every dollar's worth of merchandise."
- 5. Loyalists formed new gov't at Barcelona, Spain, pledged to carry on the war, with five Republicans, four Socialists and one Communist in the cabinet. ¶ Presidents Roosevelt and Quezon agreed to extension of preferential trade relationships between U.S. and Philippines to 1960 instead of 1946, the date set for complete Philippine independence.
- 8. U.S. house defeated the administration's bill to reorganize executive branches of the gov't by a vote of 204 to 196. ¶ Léon Blum resigned as premier of France.
- 9. U.S. senate passed \$5,000,000,000 tax bill, with the administration's tax on undistributed profits omitted and with capital-gains tax sharply modified.
- 10. Germany and Austria voted in national plebiscite 49,326,791 to 452,180, or 99.08%, in favour of union of Austria with Germany. ¶ Edouard Daladier, Radical Socialist premier of France, formed anti-Communist cabinet.
- 11. Richard Whitney, five times president of the New York Stock exchange, sentenced to five to ten years in Sing Sing prison for grand larceny of \$214,000 in securities left with his firm for safekeeping.
- 12. French gov't voted special powers to Premier Daladier to conduct financial affairs by decree until July 31.

 ¶ Norman H. Davis appointed pres. of American Red Cross to succeed late Rear Admiral Cary T. Grayson.
- 13. Pres. Roosevelt signed bill authorizing RFC to make loans to business and industry.
- 14. Pres. Roosevelt in message to congress proposed \$5,000,000,000 federal outlay for relief, public works and advances to business in so-called "pump-priming" program for business recovery. ¶ Despite Japanese denials recognized foreign observers announced that Japanese troops had met major defeat in Shantung province, China, the first in modern Japanese military history.
- 15. 20 U.S. railway unions rejected wage cut proposed by carriers and tentatively estimated at \$270,000,000. ¶ Spanish Insurgents reached Mediterranean and cut off Catalonia from Madrid and Valencia.
- 16. Anglo-Italian peace pact signed in Rome after five weeks of negotiation.
- 17. Rumanian gov't arrested 100 members of the Iron Guard, fascist organization, in effort to halt terrorism in Bucharest.
- 18. Dr. Francis E. Townsend, old-age pension leader, pardoned by Pres. Roosevelt on eve of beginning 30-day

- jail sentence for contempt of a congressional committee before which he had refused to testify. ¶ U.S. treasury announced abandonment of its policy of sterilizing gold.
- 23. Discovery of important attributes of cosmic rays and the new form of matter known as the X particle were announced at the California Institute of Technology as a result of two years of experimental work by Dr. Robert A. Millikan and associates.
- 24. An eight-point demand for Sudeten German autonomy was presented by Konrad Henlein in party conference at Karlsbad, Czechoslovakia. ¶ Konstantin Pats elected first pres. of Estonian republic under new constitution.
- 25. Pres. Roosevelt in a message to congress proposed that tax exemption of federal, state, and municipal securities be removed and that all gov't employees be required to pay income taxes. ¶ British mission arrived in U.S. to negotiate purchase of military aircraft.
- 26. British chancellor of the exchequer announced standard rate of income tax would be raised from 25 to 271/2%, to a basic rate of 5s. 6d. in the pound, the highest peacetime rate in British history.
- 27. All Jews in Germany ordered to report to gov't by June 30 all possessions in excess of 5,000 marks.
- 28. Great Britain and France agreed on defensive alliance and unified command in war at conference in London. ¶ A third party, the National Progressives of America, was launched at a meeting in Madison, Wis., called by Gov. La Follette of Wisconsin.
- 29. The Methodist Episcopal Church, South, in quadrennial convention, voted for reunion of northern and southern divisions of the denomination.

MAY, 1938

- 1. Pres. Vargas issued decree establishing minimum wages throughout Brazil.
- 2. French national defense cabinet raised national taxes 8% to produce 4,000,000,000 francs additional revenue.
- 3. Hitler arrived in Rome for six-day state visit. ¶ Dr. Douglas Hyde elected pres. of Irish Free State (Eire).
- 5. French gov't fixed new minimum rate of franc at 35.8 to the U.S. dollar; 179 to the British pound sterling.
- 7. 64th Kentucky Derby won by Lawrin, owned by Herbert M. Woolf of Kansas City.
- 8. Radio series, to counteract European broadcast propaganda directed at South America, begun jointly by U.S., Brazil, Bolivia, Chile, Colombia, Costa Rica, Cuba.
- 10. U.S. protested application to U.S. citizens of German decree ordering all Jews to reveal property holdings in Germany.
- 11. House passed 1938 U.S. revenue bill designed to raise \$5,300,000,000. ¶ Revolt of Integralistas (Brazilian fascists) defeated after attack on palace of Pres. Vargas.
- 12. Council of League of Nations voted 10 to 4 that recognition of Italian Ethiopia was a matter for each nation to decide.
- 13. Mexico broke diplomatic relations with Great Britain. ¶ Hungarian cabinet resigned in protest against nazi activities.
- 15. Discovery and excavation of King Solomon's Red sea port on Gulf of Aqabah (2 Kings ix:26) announced by Nelson Glueck, director American School of Oriental Research in Jerusalem.
- 16. Sir Kingsley Wood made British secretary for air, to succeed Viscount Swinton, resigned, following criticism of gov't air policies in house of commons.
 - 20. Japanese captured Suchow, Chinese railway centre.

23. French cabinet agreed to spend 5,000,000,000 francs on public works to aid business recovery.

25. Insurgent planes inflicted most intense bombing of Spanish Civil War, killing 250 and injuring more than 1,000 at Alicante, a city of 70,000.

JUNE, 1938

1. Debt service on international debts of Austria, united with Germany, defaulted.

7. League of Poles in Germany formally charged German gov't with economic, cultural and religious oppression of Polish minority in Germany. ¶ League of Nations recognized Haile Selassie as emperor of Ethiopia by accepting his partial payment of 1,000 Swiss francs as membership dues.

8. Fire destroyed large areas of Canton, China, following 12th day of continuous Japanese bombing raids. Dead and injured estimated at 8,000. ¶ Pres. Roosevelt signed measure to curb foreign propaganda agencies in U.S.

9. U.S. senate voted \$376,000,000 for flood control. ¶ British air mission to America awarded contracts to U.S. firms for 400 military planes to cost \$35,000,000.

11. Secretary of State Hull announced U.S. was taking steps to discourage sale of aeroplanes to Japan because of bombing of Chinese civilian areas.

12. Japanese troops captured Anking, capital of Chinese province of Anhwei.

13. U.S. refused to move warships from Yangtze river in reply to Japanese warning that all foreign shipping move from a 200-mi. zone on the river.

- 14. WPA announced it would purchase \$10,000,000 of clothing to distribute to needy and to revive clothing manufacture by buying up surplus. ¶ Congress passed wages and hours bill providing for minimum wages of 25 cents an hour the first year and 30 cents the second year, with industrial boards empowered to fix a 40-cent minimum in certain situations. Maximum hours of work 44 per week during the first year, 42 during second year and 40 in third year. ¶ French cabinet adopted decree to increase standing army to 1,000,000 men.
- 15. Floods along Yangtze and Yellow rivers killed 150,000 Chinese and retarded Japanese army.
 - 16. Third and final session of 75th Congress adjourned.

18. Anti-Jewish drive extended from Berlin throughout Germany by order of secret police.

20. Federal grand jury in New York indicted 18, including three reich war ministry officers, as German spies.

22. Joe Louis defeated Max Schmeling of Germany by a technical knockout in the first round of a match in New York for world's heavyweight championship.

24. International treaty signed in London to restrict hunting of whales in the arctic and antarctic and to establish a sanctuary for baleen whales between Graham's Land and Ross sea.

25. Dr. Douglas Hyde, Gaelic scholar, inaugurated as first president of Eire.

JULY, 1938

- 1. Veterans of Union and Confederate armies met in joint reunion to observe the 75th anniversary of the battle of Gettysburg. ¶ France and Turkey signed pact for joint rule in the Sanjak of Alexandretta of 10,000 sq.mi. pending a plebiscite. ¶ Germany and Britain signed pact under which Germany was to resume payment on Austrian debt owed in Britain. at reduced interest rates.
 - 10. German gov't announced that right of primogeni-

ture would cease by decree Jan. 1, 1939.

12. Germany suspended purchases from Brazil, in retaliation for latter nation's refusal to honour German clearing marks. Trade resumed July 20.

13. The British gov't increased its air force budget by $\pounds_{22,900,000}$ and announced its intention of purchasing

heavy bombing planes from Canada.

14. Having flown around the world in 3 days 19 hr. 8 min. and 10 sec., Howard Hughes and his four companions landed in New York city. ¶ Japan withdrew its invitation to act as host to the 1940 Olympic games.

15. Elmer F. Andrews, industrial commissioner of New York state, was appointed administrator of the new wage-

hour bill by Pres. Roosevelt.

16. German civil and military authorities expropriated 2,500 ac. of farm land occupied by Alsatians on the reich side of the French border, for use in constructing the Siegfried line of fortifications, parallel to France's famous Maginot line.

17. Spain's Civil War entered its third year as Gen.

Franco's forces pushed on toward Valencia.

18. The world chuckled at the madcap flight of Douglas Corrigan, young American aviator, from New York to Dublin in a 1929 aeroplane which cost him \$900. He lacked authorization of the department of commerce and claimed he flew eastward over the Atlantic "by mistake," having originally intended to fly back to California.

20. Eight major motion picture companies were named defendants in one of largest antitrust suits ever filed by

the U.S. gov't.

21. Sec'y of State Cordell Hull, in strong note to Mexican gov't, demanded arbitration of the controversy over American-owned agricultural and oil lands in Mexico.

¶ Bolivia and Paraguay signed the Chaco peace treaty which ended an intermittent war between the two nations begun in 1928.

23. World Anti-Bombing conference opened in Paris, where it was announced 16,532 Chinese noncombatants had been killed and 21,752 injured by Japanese bombing

planes from July 1937 to June 1938.

25. Arab-Jewish terrorism in Palestine flared anew when a bomb blast in the Arab market at Haifa killed 45 Arabs and one Jew. In the rioting which followed the explosion, seven others were slain,

26. Viscount Walter Runciman was named by Prime Minister Chamberlain to act as "adviser" to Prague in the Czechoslovakian minorities dispute. The spectacular suicide leap of a 26-year-old youth, John Warde, drew thous ands of New Yorkers to the site. For 11 hours Warde paced a narrow ledge on the 17th floor of a New York hotel and defied all attempts to rescue him.

27. Spanish gov't troops captured 15 villages and more than 4,000 prisoners in attack along Ebro river, their first sustained offensive since they took Teruel in Dec. 1037.

31. Dep't of justice charged American Medical association with violation of antitrust laws. Bulgaria regained right to rearm in pact signed with Balkan Friente at Salonika. Soviet and Japanese troops clashed again after two days of fighting at Changkufeng on disputed Manchuria-Soviet boundary.

AUGUST, 1938

- 2. Both Japan and Russia claimed victory as large-scale fighting continued around Changkufeng.
- 3. Pres. Cárdenas of Mexico refused U.S. request for arbitration of American-owned land seizures.
- 5. Premier Kung of China flew to Chungking, completing transfer of gov't to new capital in face of impending

- Japanese capture of Hankow, provisional capital city.
- 8. Chinese reported exposure of plot by separatists in south China to set up independent gov't under Japanese influence.
- 9. Father Divine, Negro preacher, arrived at Crum Elbow with 2,500 "angels" to take possession of his newly purchased "paradise" across the Hudson river from Pres. Roosevelt's estate.
- 10. Armistice agreement reached by Maxim Litvinov and Japanese Ambassador Shigemitsu to cease border fighting Aug. 11 and to set up commission of two Russian and two Japanese-Manchurian representatives to fix boundary line. ¶ Pres. Roosevelt resumed "party purge" by endorsing Lawrence Camp, opponent of Senator Walter F. George, for Democratic senatorial nomination of Georgia; the next day he assailed George directly as a reactionary.
- 14. "Queen Mary" established new record for eastward crossing of Atlantic: 3 days 20 hr. 42 min. Six days before, it had set a new westbound record.
- 16. Sen. Millard Tydings of Md. and Rep. John J. O'Connor of N.Y. were denounced by Pres. Roosevelt, who urged their defeat in primary elections.
- 18. Assistance to Canada in case of invasion by any foreign power was pledged by Pres. Roosevelt in Kingston, Ont., address.
- 19. British troops and Arab rebels clashed in battles at Hebron and on plain near Nablus.
- 20. Vatican and Italian gov't announced new accord by which Catholic Action associations agreed to refrain from political activities.
- 21. Gen. Franco announced categorical rejection of British plan for proportionate withdrawal of foreign troops from Loyalist and Insurgent armies.
- 23. Right of Hungary to rearm was affirmed by Little Entente conference in Bled, Yugoslavia.
- 24. Hitler guaranteed sanctity of Hungarian border, at state banquet honouring Admiral Nicholas Horthy in Reelin
- 26. British home fleet ordered to leave south England bases for battle stations at Invergordon, Scotland, on Sept. 6, the opening day of Hitler's nazi congress at Nürnberg.
 - 28. Missionaries reported death of Tibetan regent.
- 29. Maj. Alexander P. de Seversky, aeroplane designer, set new U.S cast-west transcontinental speed record of 10 hr. 3 min.
- 30. British and French cabinets met in special sessions to deal with Czech crisis. Foreign Minister Georges Bonnet reaffirmed France's intention of supporting Czechoslovakia in case of German invasion. Sir Nevile Henderson, British ambassador to Germany, was instructed to fly back to Berlin with verbal warning to Hitler against undertaking war. ¶ Soviet naval commissariat confirmed repeated rumours that highest ranking officers of Russian navy—including Admiral Vladimir R. Orloff, former commander in chief, and Admiral A. K. Sivkoff, former commander of Baltic fleet—had been executed at Stalin's order.

SEPTEMBER, 1938

- 1. Pres. Lázaro Cárdenas opened Mexican congress with speech in which he refused U.S. demands for arbitration of land scizures. ¶ Foreign Jews who had entered Italy after 1919 were ordered by cabinet decree to emigrate within six months. ¶ Hitler, in conference with Konrad Henlein at Berchtesgaden, rejected Czechs' third proposal for negotiation of Sudeten dispute.
- 2. Italian gov't continued attack on Jews by barring non-Aryan teachers and students from all state and private schools.

- 5. Prague cabinet drafted fourth and "final" offer to German Sudetens; plan in essence met Konrad Henlein's eight-point autonomy demands pronounced at Karlsbad April 24. ¶ France cancelled all army furloughs and moved additional reservists into Maginot line. ¶ U.S.A. retained Davis cup by defeating Australia, 3 to 2.
- 6. Nazi party congress formally opened at Nürnberg; Hitler declared that a wartime blockade of Germany would be "entirely ineffective." ¶ Registration of all aliens engaged in propaganda and political activities for foreign nations ordered by U.S. dept. of state.
- 8. France announced completion of military preparations, with 1,200,000 men under arms; naval ministry cancelled all leaves in Atlantic fleet.
- 9. Hitler warned that Germany "is determined to capitulate to no one," in address before 180,000 party leaders at Nürnberg.
- 12. Hitler demanded self-determination for Sudeten Germans and pledged them military aid; his speech closing Nürnberg party congress was followed by nazi demonstrations in Sudeten area. ¶ Justice Ferdinand Pecora of New York declared mistrial in case of James J. Hines, Tammany leader charged with protecting "policy numbers" racketeers; Pecora ruled that District Attorney Thomas E. Dewey had prejudiced Hines's case by attempting to link defendant with New York city poultry racket. ¶ Entire Chilean cabinet resigned as political aftermath of Sept. § uprising; Pres. Arturo Alessandri declared state of siege.
- 13. Sudeten party issued ultimatum to Czech gov't that it revoke martial law declared in Sudeten areas after several fatalities in clashes between state police and nazis; Prague ignored ultimatum, which expired early Sept. 14.
- 15. Prime Minister Chamberlain made flight to Germany for three-hour conference with Hitler at Berchtesgaden. Czech gov't ordered arrest of Henlein for treason; Sudeten leader fled to Germany.
- 16. Great Britain asked League of Nations to make sanctions provisions of covenant optional for all adhering powers. ¶ British Capt. George E. T. Eyston set new world's automobile speed record of 357.5 m.p.h. at Bonneville salt flats, Utah; he broke John R. Cobb's one-day record of 350.2 m.p.h. and his own former mark of 345.49 m.p.h., established Aug. 27.
- 17. State of emergency declared by Czech cabinet for whole nation; British cabinet considered proposal to let Hitler annex Sudeten regions.
- 18. Premier Milan Hodza broadcast Czech cabinet's refusal of plebiscite for Sudeten Germans.
- 19. France and Great Britain instructed their ministers at Prague to recommend to Czech gov't the surrender of all regions with predominant German populations, in return for Anglo-French guarantee of new boundaries. ¶ League of Nations Assembly for the first time invoked article XVII of covenant by asking Japan to assume membership duties temporarily for arbitration of Sino-Japanese War. Japan declined the invitation on Sept. 21.
- 21. Czech cabinet accepted Anglo-French plan for cession of Sudeten territories to Germany, "because we were alone." The decision, subject to parliamentary approval, was reached after Britain and France had presented a second "ultimatum" to Pres. Benes at 2 a.m. ¶ Budapest and Warsaw démarches to Czechoslovakia demanded same rights for Hungarian and Polish minorities as for German.
- 22. Gen. Jan Syrovy replaced Milan Hodza as Czech premier; he was named minister of war also.



Historic meeting of Sept. 29, 1938, at Munich, Germany. Foreground, left to right: Prime Ministers Chamberlain and Daladier, Adolf Hitler and Benito Mussolini

23. Hitler and Chamberlain resumed talk, with exchange of letters, at Godesberg. In night conversation which ended early next morning, Hitler prepared memorandum accompanied by map in which he demanded evacuation by Oct. 1 of all Sudeten areas with preponderant German populations, also plebiscites within 60 days in all other Czech areas with German minorities, including three "island" territories. Chamberlain, as he declared later, "bitterly reproached the chancellor," but agreed to convey ultimatum to Czech gov't. ¶ U.S.S.R. notified Warsaw it would denounce its nonaggression treaty with Poland if latter nation invaded Czech territory. ¶ Daladier declared France would march to Czechoslovakia's aid if Germany resorted to arms to enforce Godesberg demands.

24. Rumania joined Yugoslavia in Little Entente warning to Hungary against violation of Czech border. ¶ J. Donald Budge won U.S. national lawn tennis championship and became only player in history to win all four major tennis titles of the world in single year; Alice Marble won women's championship.

25. Hitler's ultimatum of Sept. 23 rejected unconditionally by Czech gov't.

26. Hitler excoriated Czechoslovakia as a nation founded upon a "lie" and a "swindle," said he would brook no more delay in settlement of Sudeten crisis, and declared that Sudetenland was his last territorial claim in Europe. J British cabinet made first definite commitment of military aid to Czechoslovakia and France in case of German invasion of Sudetenland.

27. New German ultimatum demanded Czech evacuation of Sudetenland by 2 p.m., Sept. 28. ¶ Second note by Roosevelt sent to Hitler after latter had replied to first note and disclaimed all responsibility for imminent war. Roosevelt also dispatched personal message to Mussolini, urging him to intervene with Hitler. ¶ Entire British navy ordered to mobilize. King George declared a state of emergency. ¶ Queen Elizabeth christened 85,000-ton liner bearing her name.

28. Hitler suddenly called Four-Power conference, shortly before German ultimatum was about to expire at 2 p.m.

29. Hitler, Daladier, Mussolini and Chamberlain met at Munich; they drafted agreement which provided for German occupation of Sudetenland between Oct. 1 and Oct. 10, for plebiscites before Nov. 30 in other areas as determined by international commission of the Four Powers, and for new conference in case of dispute over Polish and Hungarian minorities territory. In annex to agreement, Britain and France guaranteed new boundaries of Czechoslovakia against "unprovoked" aggression.

30. League of Nations council voted that sanctions under articles XVI and XVII of covenant were applicable against Japan. ¶ Munich pact signed by Four Powers. Chamberlain and Hitler later issued joint communiqué in which they characterized pact as "symbolic of the desire of our two peoples never to go to war with one another again." ¶ Czech cabinet accepted provisions of Munich pact. ¶ Polish ultimatum demanded that Czechs evacuate Teschen district by noon Oct. 1. ¶ Fall of Tienchiachen, key fortification in defense of Hankow, admitted by Chinese gov't.

OCTOBER, 1938

1. German troops crossed Czech border near Aigen to begin occupation. Henlein appointed commissioner of Sudetenland. ¶ Czechoslovakia yielded to Poland's Teschen ultimatum.

2. Czech gov't agreed to negotiate Hungarian demands for cession of territory. ¶ Polish troops occupied Teschen.

3. British gov't instructed Bank of England to loan Czechoslovakia £10,000,000. ¶ Japan threatened "countermeasures" against any nation which adopted sanctions in accordance with League report of Sept. 30. ¶ Hitler made triumphal entry into Sudetenland.

4. Premier Syrovy reshuffled Czech cabinet; Frantisek Chvalkovsky, minister to Italy, named foreign minister.

5. Eduard Benes resigned as president of Czechoslovakia. ¶ Emergency economic and financial powers granted Premier Daladier by French chamber of deputies, 331 to 78, and by senate, 286 to 4. Earlier the chamber had approved Daladier's part in Munich accord, 535 to 75. ¶ Hungarian troops invaded two Czech border towns. ¶ British troops and planes killed 80 Arabs in renewed Palestine fighting near Safed and Mount Tabor.

6. House of commons voted approval of Chamberlain's peace policy, 366 to 144. ¶ Slovakia was granted complete autonomy, except in foreign relations, national defense, and national fiscal policy, by Czech gov't.

7. U.S. state dep't made public text of note delivered to Italian gov't Oct. 5 which asked exemption of American Jews from anti-Semitic decrees and implied retaliation in case request was not recognized. § Germany granted circlit of 150,000,000 marks to Turkey for "industrial and military equipment."

8. Italian chamber of deputies officially abolished, to be replaced by chamber of fasces and guilds. ¶ Gen. Franco announced immediate withdrawal of 12,000 Italian troops from Insurgent army. ¶ Nazi mob attacked and partially destroyed Vienna palace of Cardinal Innitzer, who was slightly injured.

9. New York Yankees defeated "Gabby" Hartnett's Chicago Cubs in fourth straight game (scores, 3-1, 6-3, 5-2, 8-3) to win world baseball championship. ¶ Hitler, in Saarbrucken speech, announced demobilization of reservists but continued construction of fortifications on western border; he criticized Britain's "governess-like"

guardianship of Germany." ¶ Czechs, represented by new autonomous state of Slovakia, met at conference with Hungarians in Komarom (Komarno); Slovaks agreed to cede two towns and to discharge Hungarian troops. ¶ Chinese claimed overwhelming victory near Tei-an.

10. 11 soviet aviators denounced Col. Charles A. Lindbergh as a "mercenary liar" who slandered the Russian air force as vastly inferior in order "to provide Chamberlain with an argument in favour of capitulation in Munich." ¶ U.S. supreme court, with Justices Black and Reed dissenting, denied plea for reviewing case of Thomas J. Mooney, convicted for alleged participation in 1916 bombing. ¶ Paraguay-Bolivia boundary in Chaco fixed by arbitral award of presidents of six American nations.

11. Henry Ford conferred with Homer Martin, president of United Automobile Workers, for first time; Martin later presented proposal for 32-hr. week in Ford plants.

12. Japanese landed 40,000 troops at Hachung in Bias bay, about 35 mi. from Hong Kong, to begin offensive in south China. ¶ French cabinet confirmed appointment of André François-Poncet as ambassador to "the King of Italy . . . and emperor of Ethiopia" and thus in effect recognized Italian sovereignty over Ethiopia.

13. Hungary broke off negotiations with Czechoslovakia at Komarom and asked mediation by Munich pact signatories. ¶ William Green re-elected president of American Federation of Labor for 14th consecutive term.

15. Brazil and Germany again recalled their ambassadors.

16. Winston Churchill, in reply to Hitler's attack upon him, repeated his denunciation of the Munich pact and called for an alliance of Great Britain and the U.S.A.

18. Martial law proclaimed in all Palestine as British troops laid siege to Jerusalem; Grand Mufti of Jerusalem demanded abandonment of Balfour declaration as price for Arab peace. § General Motors corporation ordered 35,000 back to work and restored salary cut of 30,000 other workers.

19. British troops defeated Arab rebels in Jerusalem and occupied city.

21. Canton fell to Japanese troops without opposition after reported "sellout" by Chinese military authorities.

22. Pres. Cárdenas of Mexico offered British and American oil companies full indemnity for land expropriations.

23. U.S. gunboats ignored Japanese warning to leave Hankow; British patrol ship "Sandpiper" hit by bombs at Chang-sha.

24. Fair labor standards act went into effect; all pecanshelling factories in south closed because of inability to comply with new law.

26. Japanese captured Hankow; Chinese gov't officials, civilians of the Wu-Han cities, and main body of Chinese troops escaped toward west and southwest. ¶ Libya raised from colonial status to part of Italy proper by decree of fascist grand council. ¶ Japanese storm troops captured Tei-an, key defense city of central China.

27. Federal court decision enjoined Mayor Frank Hague of Jersey City from interfering with right of C.I.O. to organize. ¶ Earl Stanhope appointed British first lord of admiralty to succeed Alfred Duff Cooper, Earl De La Warr became president of board of education.

28. Thousands of Polish Jews in Germany seized and deported a few hours before new law barring re-entry became effective in Poland; the nazi order was later revoked partially.

29. Return of all German colonies demanded by Gen. Franz von Epp, director of nazi party's colonial policy office.

30. Radio dramatization of H. G. Wells' War of the Worlds terrorized thousands of U.S. listeners who believed the description of a Martian invasion factual.

31. Gen. Ludwig Beck resigned as chief of German general staff after reported rift with nazi leaders during Sudeten crisis; he was succeeded by Gen. Franz Halder. ¶ Sir John Anderson appointed British lord privy seal, in charge of civilian defenses; Colonial Sec'y Malcolm MacDonald assumed second cabinet post as Dominions sec'y; Viscount Runciman named lord president of the council.

NOVEMBER, 1938

2. German-Italian arbitration committee at Vienna awarded Hungary a strip of Czech territory with area of approximately 5,000 sq.mi. along southern border of Slovakia; Hungary and Czechoslovakia accepted the award. ¶ Anglo-Italian treaty of friendship approved by house of commons, 345 to 138.

4. Observance of open door policy and Nine-Power treaty of 1921-22 demanded of all adhering powers, in-

cluding Japan, by Sec'y of State Hull.

6. Admiral Nicholas Horthy led Hungarian troops into Komarom to begin occupation of territory ceded by Czechoslovakia.

7. Two royal air force planes broke world's non-stop distance record by flying 7,162 miles from Ismailia, Egypt, to Fanny bay, near Darwin, Australia.

8. Republicans gained 81 representatives, 8 senators, and 11 governors in national elections. ¶ Hitler in Munich speech said Germany would secure its lost colonies "in a different way" if France and Great Britain refused to negotiate his request for their return to the reich.

9. British cabinet proposed Arab-Jewish conference to deal with Palestine problem after formally disavowing Peel partition plan of July 1937.

10. Violent anti-Jewish riots broke out in Germany in reprisal for assassination of Ernst vom Rath, German diplomat, by a young Polish Jew in Paris.

11. International Ladies' Garment Workers union board voted to withdraw its 250,000 members from the C.I.O. and remain independent of both national labour unions. § Gen. Ismet Inonu elected president of Turkey by unanimous vote of national assembly to succeed Kemal Ataturk, who died Nov. 10.

12. German gov't imposed fine of 1,000,000,000 marks on German Jews, ordered them to pay for all property damage in semi-pogroms of Nov. 10 and 11, barred them from operating retail or mail-order establishments after Jan. 1, 1939, and prohibited them from attending any theatre, concert or lecture. ¶ Mexican gov't agreed to arbitrate all claims for seizure of American-owned agricultural lands from 1927.

13. Mother Frances Cabrini beatified by Pope Pius and became first U.S. citizen thus honoured.

14. Hugh R. Wilson, U.S. ambassador to Germany, ordered to return home for "report and consultation." § First C.I.O. convention opened at Pittsburgh; Roosevelt's plea for labour peace applauded by delegates. § Antanas Smetona re-elected president of Lithuania for seven-year term.

15. Retirement of Homer S. Cummings as U.S. attorney general announced by Pres. Roosevelt, to take effect in Jan. 1939; James Roosevelt resigned temporarily as president's secretary.

16. Great Britain recognized Italian sovereignty over Ethiopia; Anglo-Italian pact went into operation.

17. U.S.A. signed trade treaties with Great Britain and Canada. ¶ Battle of the Ebro river ended as Spanish Insurgents re-occupied entire western bank.

18. Hitler recalled Ambassador Hans Dieckhoff to report on Roosevelt's "strange attitude" toward Germany's anti-Jewish drive. ¶ John L. Lewis elected first president of Congress of Industrial Organizations by unanimous vote. ¶ Japanese reply to U.S. protest of Oct. 6 described the open door in China as an "inapplicable idea of the past."

19. Autonomy for Slovakia and Ruthenia approved by lower house of Czech parliament.

21. Great Britain divulged plan for leasing land in British Guiana and Tanganyika to Jewish refugees from Germany.

23. Prime Minister Chamberlain arrived in Paris for consultation with Daladier. ¶ Bela Imredy resigned as premier of Hungary; his resignation was refused by Admiral Horthy Nov. 28.

24. Colombia severed diplomatic relations with Germany after attempted arrest of minister in Berlin.

25. Martial law proclaimed throughout Bolivia after suppression of Leftist rebellion.

26. Poland and U.S.S.R. reaffirmed nonaggression pact of 1932 and agreed upon new measures to promote trade. § Bolivia and Paraguay officially resumed diplomatic relations.

27. Bulgarian troops' enforced martial law in Sofia after riots which marked 19th anniversary of treaty of Neuilly.

28. Balkan Entente opened 10-day conference at Athens to consider problems precipitated by Bulgarian and Hungarian agitation for revision of treaties of 1919.

29. Japanese army and navy in China closed Yangtze river to all foreign shipping for duration of war.

30. French 24-hr. general strike collapsed as majority of workers refused to walk out. ¶ Italian deputies at last session of chamber demonstrated for annexation of Tunisia, Corsica, Nice and Savoy. ¶ Corneliu Codreanu, leader of Rumanian Iron Guard, and 13 associates killed by prison guards. ¶ German passenger plane landed at Tokyo after 8,375-mi. flight from Berlin in 46 hr. 41 min. ¶ Dr. Emil Hacha elected president of Czechoslovakia by national assembly; he named Rudolf Beran premier.

DECEMBER, 1938

- 1. Isador Lubin, commissioner of labour statistics, said at opening session of Sen. J. C. O'Mahoney's monopoly inquiry that depression had cost U.S. citizens \$132,000,000,000 in real income.
- 2. France lodged protest to Italy against deputies' demands for French territories.
- 6. France and Germany signed nonaggression pact at Paris.
- 8. Conciliation with labour pledged as objective of National Association of Manufacturers in annual platform adopted at New York city. ¶ Nikolai Yezhov, soviet commissar of internal affairs and conductor of 1936–38 "purges," replaced by Lorenti Beria.

9. Eighth International conference of American states convened at Lima, Peru.

10. Pres. Roosevelt announced he would bequeath his Hyde Park estate, with collection of papers, books, and correspondence, to U.S. gov't.

11. Chinese communist guerrilla army reported major victory near Wutai, Shan-si province, in which 6,000 Japanese troops were killed. ¶ German party won 25 of

29 Landtag seats in Memel election; Ernst Neumann, party leader, demanded complete freedom from rule of autonomous gov't.

12. World Missionary Conference, attended by delegates of 61 nations, opened at Madras, India.

13. Nazi diplomats in London boycotted dinner at which Prime Minister Chamberlain rebuked German press for attacks upon former Prime Minister Baldwin.

15. Spanish Insurgent gov't restored full citizenship status of former King Alphonso XIII. ¶ Daniel C. Roper submitted resignation as sec'y of commerce, effective Dec. 23. ¶ F. Donald Coster, president of McKesson & Robbins, large drug company with \$18,000,000 in missing assets, was revealed by New York city police to be Philip Musica, an ex-convict and swindler; Coster killed himself Dec. 16. ¶ U.S. Export-Import bank granted \$25,000,000 credit to China; Foreign Minister Arita of Japan declared on Dec. 19 that the loan was "regrettable" and "dangerous."

16. Hjalmar Schacht, German reichsbank president, proposed plan to Great Britain whereby Jews would be evacuated from Germany in return for foreign trade concessions.

17. John L. Lewis announced that Labor's Non-Partisan league would enter the 1940 Democratic primaries.

18. Alfred M. Landon said in Lima broadcast that all U.S. political parties would unite immediately against any outside aggression directed at the Americas.

19. Foreign Minister Bonnet declared before chamber of deputies that France would not give up an inch of territory to Italy.

20. Federal grand jury indicted American Medical association, 3 affiliated associations, 21 physicians, for alleged violation of antitrust laws.

22. Germany's protest against anti-nazi speech of Sec'y Ickes at Cleveland was rejected by U.S.A. as "improper" and timed with "singular ill grace." ¶ Italy denounced Laval-Mussolini agreement of 1935.

23. Spanish Insurgents began long-delayed offensive on Segre river sector.

24. Declaration of Lima, signed by 21 nations at Pan-American conference, affirmed their "continental solidarity," and their intention to defend their sovereignty against "all foreign intervention."

26. France accepted Italy's denunciation of 1935 pact with another warning against territorial aggression. § Finland and U.S.S.R. approved demarcation of border. ¶ Wang Ching-wei, leader of Chinese "peace party," reported ready to discuss truce with Japanese.

28. King Carol recalled Rumanian minister to Germany for indefinite period. ¶ France ordered destroyer and 1,000 Senegalese sharpshooters to Jibuti to meet threatened Italian invasion of Somaliland.

30. Iran severed diplomatic relations with France after accusing Parisian press of slurring Riza Shah Pahlavi.

31. British naval delegation returned from Berlin after failure to reach agreement with reich over interpretation of naval pacts of 1935 and 1937.

JANUARY, 1939

- 1. Chiang Kai-shek ordered arrest of approximately 200 followers of Wang Ching-wei, former premier expelled from Chinese gov't for attempted peace negotiations with Japan.
- 2. Premier Daladier began "colonial solidarity" tour with visit to Ajaccio, Corsica.
- 3. 76th U.S. congress convened; report of senate's committee on campaign expenditures charged use of WPA funds for political purposes in three states.

- 4. Adequate national defense and preservation of democracy against encroachments of authoritarian states urged by Roosevelt in message to congress on state of the union. ¶ Cabinet of Fumimaro Konoye resigned; Baron Kiichiro Hiranuma named Japanese premier.
- 5. Deficit of \$3,326,000,000 for fiscal year 1940 estimated by Pres. Roosevelt in annual budget message to congress. ¶ Spanish gov't troops seized mountain chain in surprise offensive on Estremadura front; Insurgents captured Borjas Blancas in Catalonia.
- 6. Czech and Hungarian troops clashed near Munkacevo on new Ruthenian frontier.
- 7. Thomas J. Mooney pardoned by Gov. Culbert Olson of California after 22 years' imprisonment for alleged implication in San Francisco bombing.
- 11. Lincoln Ellsworth claimed 81,000 sq.mi. of newly discovered land in Antarctica for U.S.A.
- 12. Chamberlain concluded two-day visit to Mussolini with "no new commitment, arrangement or agreement."
- 13. House of representatives reduced relief deficiency appropriation from \$875,000,000 requested by Roosevelt to \$725,000,000; the senate approved the reduction on Jan. 27 by 47 to 46 vote.
- 14. British note to Japan protested against violation of Nine-Power treaty, but offered to negotiate modifications to pact.
- 15. Tarragona fell to Spanish Insurgents in steady drive of Gen. Franco's troops toward Barcelona.
- 16. Bombings in Manchester, Liverpool, Belfast and London attributed to terrorists of outlawed Irish Republican army.
- 17. U.S. senate confirmed appointments of Felix Frankfurter as associate justice of supreme court and Frank Murphy as attorney general.
- 20. Hitler removed Dr. Hjalmar Schacht as president of reichsbank and appointed Walther Funk to succeed him.
- 23. Martial law decreed in Barcelona as Insurgent troops pushed to within 12 mi. of Loyalist capital. ¶ Harry L. Hopkins confirmed as sec'y of commerce by 58 to 27 vote of senate after bitter debate on qualifications. ¶ U.S. army pursuit plane attained record speed of 575 m.p.h. in power dive during test at Buffalo.
- 24. C.I.O. announced it would support Homer Martin's opponents in internal strife of United Automobile Workers' union; Martin resigned from the C.I.O. executive board Jan. 25.
- 25. Loyalist gov't fled to Gerona and Figueras as Insurgent troops surrounded Barcelona and cut off escape of refugees.
- 26. Barcelona surrendered to Gen. Franco's troops without struggle.
- 27. Pres. Roosevelt revealed he had authorized purchase by France of large number of U.S. fighting planes.
- . 28. The democracies would unite in resisting any "demand to dominate the world by force," asserted Prime Minister Chamberlain in address at Birmingham.
- 29. Thousands of Spanish refugees crossed French border in mass trek as Franco's army marched through northern Catalonia with scant resistance.
- 30. Germany "wants peace and quiet," but remained determined to regain colonial possessions, Hitler declared in reichstag speech. ¶ U.S. supreme court dismissed suit of 14 private utilities to enjoin competitive activities of Tennessee Valley authority.

FEBRUARY, 1939

1. Roosevelt's declaration of support for European democracies provoked bitter debate in senate; German

- and Italian newspapers attacked statement as war agitation.
- 2. U.S.S.R. severed diplomatic relations with Hungary after latter nation had joined anti-Comintern pact.
- 3. Roosevelt denied published reports that he had declared American frontier to be in France. ¶ Dies committee investigation on un-American activities extended for year by house of representatives, 344 to 35.
- 4. Renewed frontier clashes on Soviet-Japanese border near Manchuli reported. ¶ TVA agreed to purchase properties of Commonwealth and Southern corporation in Tennessee for \$78,000,000.
- 5. France opened border at Perthus to retreating Loyalist army, estimated at 200,000 men.
- 6. Dragisha Cvetkovitch sworn in as Yugoslav premier to succeed Milan Stoyadinovitch, who resigned Feb. 4. ¶ Franco demanded unconditional surrender of Loyalists with no guarantee of plebiscite or of amnesty for gov't leaders.
- 7. Palestine conference opened in London; Prime Minister Chamberlain pleaded for reconciliation between Jewish and Arab delegations. ¶ U.S.S.R. and Italy resumed commercial relations severed from 1937.
- 9. Island of Minorca surrendered to Spanish Insurgents after peace negotiations aboard British cruiser, which later evacuated 450 Loyalists. ¶ Alex Henshaw, British flier, broke all speed records from England to Cape Town, making round trip in 4 days 10 hr. 16 min. ¶ Taxation of all federal, state and municipal employees voted by house of representatives 269 to 103. ¶ Premier Paul-Henri Spaak of Belgium resigned.
- 10. Pope Pius XI died at Vatican City; he was buried in the crypt of St. Peter's Feb. 14. ¶ Japanese occupation of Hainan island imperilled British and French defenses of possessions in far east.
- 11. Loyalist cabinet met in Valencia to reorganize administration in central Spain; gov't moved to Madrid Feb. 12.
- 13. Justice Louis D. Brandeis retired from U.S. supreme court.
- 14. Germany's first 35,000-ton battleship, the "Bismarck," launched at Hamburg.
- 15. House of representatives voted 367 to 15 to add 3,000 planes to U.S. air force; senate increased total number to 6,000 on March 7. ¶ Great Britain announced it would build two more battleships, bringing total under construction to nine. ¶ Bela Imredy, anti-Semitic premier of Hungary, resigned after admitting truth of charges that his great-grandfather was a Jew; Count Pal Teleki formed new cabinet Feb. 16.
- 18. Golden Gate International exposition opened at San Francisco.
- 19. Peruvian troops speedily subdued revolt during absence of Pres. Benavides; Gen. Antonio Rodríguez, leader of the attempted coup, was slain.
- 20. Mass meeting of 22,000 members of German-American bund in New York city precipitated disorders and drew large crowds of anti-nazis to scene.
- 21. Legal borrowing limit of British gov't extended to £800,000,000 by house of commons to pay for expenses of rearmament in 1939-40. ¶ Existence of U.S. Export-Import bank extended to June 30, 1941, by house of representatives, 280 to 77. ¶ Japanese planes bombed British railroad station in Hong Kong, killing Indian policeman and wounding others. ¶ "King George V," new British 35,000-ton capital ship, launched by King George VI.

23. Bill to fortify Guam defeated by house of representatives, 205 to 168.

24. Sec'y of Commerce Hopkins said in Des Moines address that New Deal had shifted emphasis of its economic program from reform to recovery and was determined to encourage private business and capital.

25. Pres. Roosevelt requested John L. Lewis and William Green to negotiate "peace with honour" between C.I.O. and A.F. of L.; Green accepted proposal same day; Lewis on Feb. 28. ¶ James J. Hines found guilty on 13 charges of participation in "numbers" racket; he was sentenced to serve four to eight years in prison March 23. ¶ Polish students attacked German embassy at Warsaw but cheered Count Galeazzo Ciano. ¶ Italian citizens began mass repatriation from France.

26. British gov't announced to Arab-Jewish conference in London that it proposed to relinquish mandate over Palestine and set up independent state; Jewish delegates rejected plan next day.

27. France and Great Britain granted unconditional recognition to Franco's gov't. ¶ Sit-down strikes outlawed by decision of U.S. supreme court, 5 to 2.

28. Manuel Azaña resigned as president of the Spanish republic.

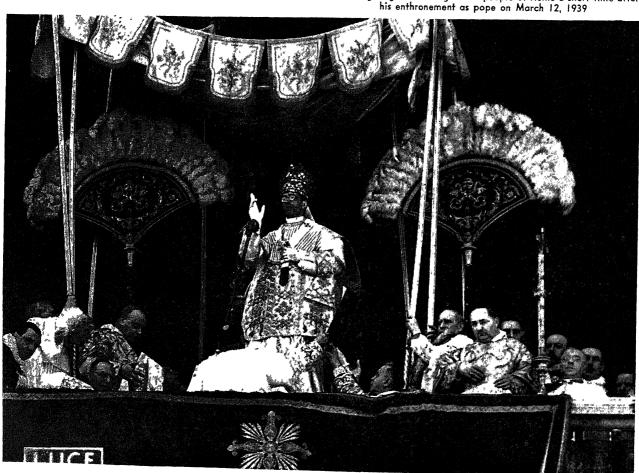
MARCH, 1939

- 1. U.S. Air Force consolidated under direction of Maj. Gen. Henry H. Arnold.
- 2. Eugenio Cardinal Pacelli elected pope on second day of cardinals' conclave; he selected title of Pius XII. ¶ Marshal Philippe Pétain appointed French ambassador to

Franco's gov't.

- 3. Pius XII expressed "hope and appeal for peace" in first public address.
- 4. Laurence A. Steinhardt appointed U.S. ambassador to Russia. ¶ Japan claimed capture of Haichow in new intensive campaign, against guerrillas in northern China.
- 5. Juan Negrin ousted as premier of Republican Spain by Gen. Segismundo Casado, army chief, who formed national defense council; revolt against Loyalists at Cartagena naval base suppressed.
- 6. Gen. José Miaja became president of Madrid's defense council; communists began series of revolts against new gov't. ¶ Japan announced six-year naval building program to cost 1,700,000,000 yen and give nation parity with U.S. and Britain.
- 7. C.I.O. proposed formation of a single federation of American labour. ¶ Armand Calinescu appointed premier of Rumania after death of Miron Cristea the preceding day. ¶ United Automobile Workers' union, with Homer Martin as president, formally seceded from the C.I.O. ¶ Spanish Republican fleet of 11 vessels voluntarily interned at Bizerte, French naval base in Tunisia. ¶ Mohandas Gandhi ended four-day fast in protest against autocracy of Thakore Saheb of Rajkot.
- 8. 19 divisions of 300,000 British troops would be sent to France in event of war, Leslie Hore-Belisha announced to house of commons. ¶ Cochran-Warren reorganization bill passed by house of representatives, 246 to 153; senate approved, 63 to 23, on March 22. ¶ Palestine conference meetings suspended by order of British gov't.
 - 9. U.S.-Brazilian commercial agreements concluded at

Pius XII giving his blessing to the people of Rome a short time after his enthronement as pope on March 12, 1939



- Washington; terms provided for extension of more than \$100,000,000 in credit to Brazil.
- 10. Premier Josef Tiso of Slovakia ousted by Czech gov't; he addressed appeal to Hitler for assistance in proclaiming complete independence of Slovakia from Prague. ¶ Stalin, in opening address before 18th Communist party congress in Moscow, accused democracies of attempting to provoke Soviet-German war.
- 11. Dr. Karl Sidor named premier of Slovakia as German troops massed on border near Bratislava. ¶ Luigi Cardinal Maglione appointed papal secretary of state by Pius XII.
 - 12. Pope Pius XII crowned on balcony of St. Peter's.
- 13. German ultimatum to Prague reputedly demanded division of nation into three "independent" states.
- 14. Republic of Czechoslovakia collapsed as Slovakia and Ruthenia declared independence; Hungarian troops began occupation of Ruthenia after skirmishes with Czech troops; Josef Tiso reinstated as Slovakian premier.
- 15. Dr. Emil Hacha "requested" German protectorate over Czechoslovakia, which nation Hitler thereupon proclaimed nonexistent; Hitler, preceded by German troops, entered Prague.
- 16. Hitler proclaimed protectorate over Bohemia and Moravia and assumed protection of Slovakia at invitation of Josef Tiso; Hungary formally announced annexation of Ruthenia.
- 17. British ambassador to Berlin recalled for consultation; Chamberlain condemned Germany's disregard of written pledges. ¶ U.S.A. refused recognition of German protectorates over Bohemia, Moravia and Slovakia; note of state dep't called occupation an act of "wanton law-lessness and arbitrary force."
- 18. Dictatorial powers to rule by decree granted Premier Daladier by chamber of deputies; French ambassador to Berlin ordered to return to Paris. ¶ Germany rejected French and British protests over annexation of Czechoslovakia; nazi foreign office recalled ambassador to London; Baron Constantin von Neurath named reich protector of Bohemia and Moravia.
- 19. Soviet note to Berlin declared seizure of Czechoslovakia illegal and withheld Russian recognition. ¶ Berlin welcomed Hitler as "aggrandizer of the reich" upon his return from tour of Bohemia.
- 20. William O. Douglas nominated to supreme court by Pres. Roosevelt; he was confirmed by senate April 4. ¶ Pres. Roosevelt abandoned request for increase in limitation of \$45,000,000,000 on U.S. public debt, but asked congress to increase \$30,000,000,000 limit on amount of bonds outstanding at one time.
- 21. Italian fascist grand council voted approval of Germany's territorial seizures. ¶ Pres. Albert Lebrun of France arrived in London on state visit.
- 22. Lithuania yielded Memel to Germany; reich agreed in formal treaty to give Lithuania access to city as free port.
- 23. Hitler made triumphal entry into Memel. ¶ Hungarian troops invaded eastern Slovakia shortly after treaty was signed at Berlin in which Germany guaranteed "political independence and integrity" of Slovakia for 25 years. ¶ Reich concluded five-year trade treaty with Rumania. ¶ King Victor Emmanuel opened new Italian chamber of fasces and corporations.
- 24. Earl Durand, Wyoming mountaineer, shot self after eight-day man hunt during which he killed four men. ¶ House of representatives tabled resolution which sought to impeach Sec'y of Labor Frances Perkins.
 - 25. Hitler declared "the German people stand shoulder

- to shoulder with the battle-proved Italian nation."
- 26. Mussolini suggested that France initiate discussions to solve "problems of Tunisia, Jibuti and the Suez canal."
- 27. "Yankee Clipper," with 21 aboard, landed in Azores on first lap of inspection flight for regular transatlantic service. ¶ Nan-chang captured by Japanese troops.
- 28. Madrid surrendered to Franco's troops after 29-month siege.
- 29. Spanish Civil War ended after 32 months of fighting; Loyalists surrendered all remaining territory in southeastern Spain.
- 31. Immediate military assistance to Poland in event of aggression pledged by Great Britain and France. ¶ Japan annexed Spratly Islands in South China sea, formally claimed by France in 1933.

APRIL, 1939

- 1. U.S.A. recognized gov't of Gen. Franco and lifted arms embargo against Spain. ¶320,000 miners in Appalachian soft coal fields quit work after expiration of contracts between operators and United Mine Workers' union.
- 3. Triple damages of \$711,932 against union affiliate of C.I.O. awarded to hosiery company in Philadelphia. ¶ Prime Minister Chamberlain invited "co-operation of any country, whatever its system of government, in resistance to aggression." ¶ Col. Josef Beck, Polish foreign minister, arrived in London to discuss military alliance with Great Britain.
- 4. Faisal II, three years old, became king of Iraq under regency following death of his father, Ghazi I, in motor-car accident. ¶ Slovakia yielded approximately 385 sq.mi. along eastern frontier to Hungary. ¶ U.S. aircraft carrier "Wasp" launched at Quincy, Mass.
- 5. Italian and German army chiefs conferred at Innsbruck as Italy prepared to occupy Albania. ¶ Albert Lebrun re-elected president of France by national assembly.
- 6. Joint administration of Canton and Enderbury islands established by Great Britain and U.S.A.
- 7. Italy invaded Albania; Albanian troops resisted for brief time in Durazzo and Valona. ¶ Thomas J. Pendergast, political "boss" of Kansas City, indicted on charges of evading income tax; he pleaded guilty and was sentenced on May 22 to 15 months in prison. ¶ Spain announced adhesion to anti-Comintern pact.
- 8. Italian troops entered Tirana; King Zog fled to Greece. ¶ Chinese troops recaptured Kaoan, west of Nanchang, and claimed wide advances in campaign to retake Canton.
- 9. Easter sermon of Pope Pius XII deplored violation of international pacts but urged justice in distribution of world's goods among nations. ¶ Occupation of Albania completed by Italian troops.
- 10. Netherlands increased border battalions to full wartime strength.
- 11. Bulgaria ordered dissolution of ratnizi, nazi party, after exposure of reported plot to overthrow gov't. ¶ Pres. Roosevelt inferred in press conference that U.S.A. would become involved if general European war broke out.
- 12. Albanian assembly offered crown to King Victor Emmanuel of Italy but voted to retain semblance of autonomy. ¶ Germany claimed 230,000 sq.mi. in Antarctica.
- 13. Guarantee of armed assistance to Greece and Rumania pledged simultaneously by Great Britain and France.
 - 15. In identical notes to Hitler and Mussolini, Pres.

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Roosevelt asked for assurance that neither would invade 31 independent nations of Europe and Asia for at least 10 years. ¶ U.S. fleet ordered to return to Pacific.

17. Marketing quotas in Agricultural Adjustment act of 1938 held constitutional by U.S. supreme court in 6 to 2

18. R. G. Menzies elected leader of United Australia party to succeed Joseph A. Lyons; he was commissioned to form cabinet two days later.

19. S.S. "Paris" of French line destroyed by fire at Le Havre; police investigated possibility of sabotage.

20. Adolf Hitler's 50th birthday celebrated by gigantic military parade in Berlin. ¶ Mussolini called Roosevelt's plea for peace an absurd proposal based on "pyramidal errors of geography."

23. Conference between Galeazzo Ciano and Yugoslav foreign minister closed at Venice; communiqué stated that Yugoslavia had agreed to "faithful collaboration" with Rome-Berlin axis.

24. Pres. Germán Busch of Bolivia dissolved congress and assumed dictatorial powers. ¶ Marquess of Lothian appointed British ambassador to the United States to succeed Sir Ronald Lindsay. ¶ Bishop Francis Joseph Spellman of Boston appointed archbishop of New York by Pope Pius XII. ¶ Leon Henderson appointed by Pres. Roosevelt to Securities and Exchange commission.

25. First gov't reorganization plan of Pres. Roosevelt requested consolidation of 21 independent bureaus and departments into three offices—Federal Security agency, Federal Works agency, and Federal Loan agency.

26. Conscription of British youths between ages of 20 and 21 announced in house of commons by Prime Minister Chamberlain; parliament approved the measure next day.

27. Pres. Roosevelt asked congress to appropriate \$1,750,000,000 for relief in fiscal year 1940. ¶ Brig. Gen. George C. Marshall appointed chief of staff of U.S. army to succeed Gen. Malin Craig. ¶ Crown Prince Olav and Crown Princess Martha of Norway arrived in U.S.A. ¶ Yugoslavian gov't reached preliminary accord with Croatian minority for granting of autonomy to latter.

28. In lengthy speech before reichstag, Hitler rejected Pres. Roosevelt's plan for peace conference; revealed that he had asked Poland for return of Danzig and for strip of land across Polish corridor; denounced naval treaty with Britain and nonaggression pact with Poland; denied any plan to attack U.S.A.; agreed to sign reciprocal nonaggression pacts with European nations upon their specific request.

29. Subhas Chandra Bose, political opponent of Gandhi, resigned as president of All-India National congress: he was succeeded next day by Rajendra Prasad.

30. New York world's fair opened by Pres. Roosevelt. ¶ Gen. Jose Felix Estigarribia, hero of war in Chaco, elected president of Paraguay. ¶ First television receiving sets offered for sale in New York city.

MAY, 1939

- 1. "Cash and carry" section of U.S. Neutrality Act of 1937 expired. ¶ U.S.A. placed Caribbean islands under single military command with headquarters in Puerto Rico.
- 2. Premier de Valera of Eire warned Great Britain that any attempt to enforce conscription in Northern Ireland would be regarded as "an act of aggression."
 - 3. Maxim Litvinov replaced as foreign commissar of

U.S.S.R. by V. Molotov, president of the council of com-

- 4. Latvia agreed to sign nonaggression pact with Germany. ¶ Northern Ireland exempted from military conscription by British gov't.
- 5. Foreign Minister Josef Beck of Poland, in speech before sejm, refused Hitler's demand for return of Danzig and for road across Polish corridor. ¶ 130,000 coal miners in midwest and west joined strike of 320,000 Appalachian miners
- 6. Johnstown won 65th Kentucky derby by six lengths; Challedon was second, Heather Broom third.
- 10. Constantine A. Oumansky appointed soviet ambassador to U.S.A.
- 11. Seizure of Danzig by Germany would lead to war, asserted Prime Minister Chamberlain.
 - 12. British-Turkish alliance announced by Chamberlain.
- 13. 15 associations of coal operators signed agreements to limit employment in Appalachian district to members of United Mine Workers' union.
- 14. "Recourse to the sword is not necessary" to solve territorial problems of Europe, declared Mussolini in conciliatory speech at Turin.
- 17. King George VI and Queen Elizabeth arrived in Quebec to begin tour in Canada and United States. ¶ British gov't published White Paper for settlement of Palestine problem; it provided for limiting Jewish immigration to 75,000 until April 1944, thereby establishing permanent population ratio of approximately two Arabs to one Jew: state would become independent, if conditions warranted, in ten years. J U.S.A., Great Britain, and France landed naval forces at Ku-lang Su Island; U.S. state dep't rejected Japanese note of May 3 which sought revision of land regulations for international concession at Shanghai. § Carl Backman, Swedish aviator, lost in Atlantic after attempt to fly alone from Newfoundland to Sweden. § Admiral Sir Dudley Pound appointed first sea lord and chief of British naval staff to succeed Sir Roger Backhouse. § Sweden, Norway, and Finland declined simultaneously to sign mutual nonaggression pacts with Germany; Denmark accepted.
- 18. Jews staged huge riots in Jerusalem and Tel-Aviv in protest against British White Paper on Palestine. ¶ Jerome N. Frank elected chairman of Securities and Exchange commission.
- 19. Gen. Franco held his long-delayed victory parade in Madrid.
- 20. "Yankee Clipper" of Pan American Airways inaugurated regularly scheduled flights between U.S.A. and Europe.
- 22. Germany and Italy signed ten-year treaty of military alliance at Berlin. ¶ Italian communiqué said all Italian troops would leave Spain before end of May. ¶ Automobile union of C.I.O. declared strike in Detroit affecting 24,000 workers; almost 50,000 others became idle the next day.
- 24. 33 men aboard sunken U.S. submarine "Squalus" were brought to surface in rescue bell; last group was rescued early May 25 after bell jammed.
- 25. Fritz Kuhn, leader of German-American bund. arrested after indictment on charges of embezzling \$14,548 from bund.
- 27. United Mine Workers and anthracite coal operators reached new two-year agreement providing for "union shop" in Pennsylvania fields; eight-week strike ended.
- 29. Franz Joseph II formally confirmed as ruling prince of Liechtenstein.
 - 30. Wilbur Shaw won 500-mi. automobile race at In-

31. U.S.S.R. would refuse to sign any pact of collective security with Great Britain and France without guarantee of all European nations along its borders, declared Premier and Foreign Minister Molotov in address before supreme soviet. ¶ Maj. Gen. George Moseley, in testimony before Dies committee, asserted a communist revolution was about to break out in U.S.A. ¶ Sir Edmund Ironside appointed British inspector general of overseas forces. ¶ Germany and Denmark signed nonaggression pact.

JUNE, 1939

- 1. Townsend old-age pension bill defeated in house of representatives, 302 to 97. ¶ President Federico Laredo Bru of Cuba ordered German ship with 907 Jews awaiting entry to leave Cuban waters; the order was later reconsidered but finally confirmed June 6. ¶ Guarantee of Yugo-slav borders pledged by Hitler during state dinner at Berlin for Regent Prince Paul.
- 3. Judge Martin T. Manton of U.S. circuit court of appeals found guilty of charges of accepting "loans" from litigants.
- 4. Homer Martin announced that his branch of the United Automobile Workers' union had voted for reaffiliation with A.F. of L., 67,000 to 3,000.
- 5. U.S. supreme court sustained injunction against Mayor Frank Hague of Jersey City restraining him and other officials from interfering with meetings of C.I.O.
- 6. Admiral William D. Leahy nominated governor of Puerto Rico by Pres. Roosevelt: Archibald MacLeish named librarian of congress. ¶ Gen. Maurice Gustave Gamelin appointed commander of all French armed forces.
- 7. King George and Queen Elizabeth arrived in U.S.A. and were greeted at Niagara Falls by Sec'y of State Cordell Hull. ¶ Estonia and Latvia signed nonaggression pacts with Germany.
- 12. William Strang of British foreign office flew to Moscow to revive negotiations for alliance with U.S.S.R. ¶ Byron Nelson defeated Craig Wood, 70 to 73, in playoff for U.S. open golf championship.
- 14. Japanese blockaded British and French concessions in Tientsin after Britons had refused to give up four Chinese accused of killing puppet customs official.
- 15. Umpire of German-American mixed claims commission found Germany guilty of sabotage in Black Tom and Kingsland munition explosions of 1916 and 1917.
- 16. Reichsbank placed under direct control of Hitler by official decree.
- 17. Propaganda Minister Goebbels called union of Danzig with Germany inevitable.
- 19. Tax revision bill passed by house of representatives, 358 to 1; it repealed remainder of undistributed profits tax and substituted flat 18% tax on larger corporations, and removed other "irritants," but continued 3-cent first-class postage; senate passed bill unanimously June 22. § Explosion of bomb in market of Haifa killed 18 Arabs in renewed terrorism.
- 21. U.S. destroyer ordered by Japanese naval commander to leave port of Swatow with all other foreign vessels after occupation of city; the order was ignored next day by Admiral Harry E. Yarnell, commander of U.S. Asiatic fleet.
- 22. London welcomed King George and Queen Elizabeth home after American tour.
- 23. U.S.A. signed agreement with Great Britain to barter 600,000 bales of surplus U.S. cotton for 85,000 tons of rubber. ¶ Hatay republic ceded to Turkey by France; latter two also signed pact of mutual assistance. ¶ Jesse H. Jones appointed administrator of new Federal Loan agency.

- 24. Chamberlain warned Germany that it could not expect peaceful settlement of European troubles unless it was "sincerely ready to talk reason with reasonable people."
- 25. U.S.S.R. confirmed reports of fighting between Soviet-Mongolian and Japanese forces from May 11.
- 26. Annual naval manoeuvres of Great Britain in North sea advanced from September to August. ¶ Formal charges of embezzling \$100,000 of funds of Louisiana State university filed against its president, James M. Smith.
- 27. Japan warned foreign shipping to leave Wenchow and Foochow before occupation of two ports.
- 28. Regular transatlantic passenger air service inaugurated by Pan American Airways.
- 29. Senate-house conference restored Roosevelt's power to devalue dollar, but senate refused to act on measure before president's authority expired next day.
- 30. U.S. senate and house adopted conference report on \$1,756,000,000 relief bill for 1940 and sent it to Pres. Roosevelt. ¶ Premier Hendrick Colijn of the Netherlands resigned; he formed another cabinet July 25 but resigned again July 27. ¶ U.S. fiscal year ended with deficit of \$3,542,000,000 and public debt at new high of \$40,440,000,000.

JULY, 1939

- 2. Cardinal Innitzer of Vienna attacked by mob during riot at suburban church.
- 5. WPA workers began national strike in protest against congressional order for 130-hr. work month. ¶ U.S. senate voted 43 to 39 to restore Roosevelt's power to devalue dollar, continue exchange stabilization fund, and fix price of domestic silver at 71.11 cents per ounce.
- 6. World's first autogiro mail route opened between Philadelphia and Camden, N.J.
- 7. Bobby Riggs of U.S.A. won all-England men's singles tennis championship at Wimbledon; Alice Marble won women's title next day.
- 10. Chamberlain said in carefully-worded statement that British pledge of military assistance to Poland would become operative if Germany attempted to annex Danzig.
- 11. Paul V. McNutt nominated as federal security administrator by Pres. Roosevelt; he was confirmed by senate next day. ¶ Italy extended order expelling all foreign residents from Tirol to include tourists.
- 14. "You cannot strike against the gov't" declared Pres. Roosevelt as negotiations proceeded for settlement of WPA's national walkout. ¶ Roosevelt sent special plea to congress to revise U.S. neutrality law.
- 16. Soviet planes bombed Fularki in Manchuria; Japanese threat to retaliate in Siberia was followed later in day by another raid at Halunarshan.
- 17. Seymour Weiss, one of Huey Long's three political heirs, indicted on charge of using U.S. mails to defraud; he was convicted Sept. 14.
- 18. President Roosevelt abandoned attempt to secure revision of neutrality law after night conference with Democratic and Republican leaders of congress.
- 20. Mussolini announced that large feudal estates of Sicily would be broken up, irrigated, and divided among peasants.
- 21. U.S. senate passed Hatch bill "without objection"; measure provided that no federal employees should engage in national political campaigns except the president, members of his cabinet and congressmen; Roosevelt signed bill Aug. 2 after warning it might infringe civil liberties.

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¶ Nazi officials announced that Italy had offered Germany free access to port of Trieste.

24. Anglo-Japanese formula for negotiation of Tientsin dispute announced by Chamberlain in house of commons; it conceded right of Japanese to "remove such causes . . . as will obstruct them or benefit their enemy."

25. Japan announced it would close Canton river for two weeks, apparently to stop commerce between Canton and Hong Kong. ¶ U.S. senate ratified treaty with Panama defining mutual relationships with respect to Panama canal

26. U.S.A. denounced Japanese trade treaty of 1911, thus making possible application of arms embargo after expiration of six months' notice. ¶ Francis B. Sayre, ass't sec'y of state, appointed U.S. high commissioner to the Philippines. ¶ Renewed bombings in London, attributed to Irish Republican army, killed one and injured 18 as house of commons passed bill to deport suspected bombers. ¶ Antitrust proceedings against American Medical association dismissed by federal court of District of Columbia.

27. John L. Lewis called John N. Garner a "labour-baiting, poker-playing, whisky-drinking, evil old man."

29. France decreed postponement of legislative elections

31. Military consultations between U.S.S.R. and Great Britain and France announced in house of commons by Chamberlain.

AUGUST, 1939

1. House of representatives killed works financing bill, 193 to 166; senate had passed bill July 31 after reducing appropriation finally to \$1,615,000,000. ¶ Vladimir Matchek, leader of Croatian minority, threatened to secede from Yugoslavia even though "it might mean a world war."

2. Great Britain signed treaty granting Poland credit of

£8,163,000 for military supplies.

3. \$800,000,000 housing bill killed by house of representatives, 191 to 170. ¶ Sen. Robert A. Taft (Rep.) of Ohio, declared his candidacy for Presidential nomination in 1940.

4. Settlement of C.I.O. strike of automobile tool and die workers in Detroit announced by U.S. conciliator; strikers ratified pact next day. ¶ House of commons adjourned; Chamberlain said the situation in the far east "makes my blood boil."

5. First session of 76th U.S. congress adjourned sine die; total appropriations during session exceeded \$13,000,000,000. ¶ Princess of Orange-Nassau, second daughter of Crown Princess Juliana of the Netherlands, born at The Hague; she was named Irene Emma Elizabeth.

6. Marshal Smigly-Rydz, in speech at Cracow, said Poland would defend its integrity against any attack, direct or indirect. ¶ Imperial Airways plane landed at Pt. Washington, L.I., to inaugurate British transatlantic mail service.

7. Saudi Arabia granted petroleum concessions for entire kingdom to Standard Oil Company of California. ¶ Richard W. Leche, former governor of Louisiana, indicted on federal charges of violating "hot-oil" act.

8. Nazi press unleashed violent attacks on Poland following address of Smigly-Rydz in Cracow Aug. 6.

9. Ramon Serrano Suñer appointed political chief of the Spanish falange council. ¶ Dirk Jan de Geer formed coalition cabinet in the Netherlands.

10. Albert Forster, nazi leader of Danzig, declared in speech after visit with Hitler that Danzig's "liberation"

might be near at hand. ¶ Roosevelt threatened to bolt Democratic party in 1940 if it nominated "conservative candidates on a straddlebug platform."

11. Count Ciano and Joachim von Ribbentrop, Italian and German foreign ministers, began two-day conference in Berlin. ¶ Britain announced it would surrender to Japan the four Chinese whose detention precipitated Tientsin incident.

12. Franco's new cabinet sworn in at Burgos. ¶ British and French military missions began conversations with Russian staff in Moscow.

14. Pres. Roosevelt announced he would proclaim Thanksgiving day for 1939 on Nov. 23 instead of Nov. 30 ¶ Young Russian artist who stole Watteau's "L'Indifférent" from the Louvre returned it after "correcting errors of earlier restorations"; experts praised his work in restoring painting.

15. José Estigarribia inaugurated as president of Para-

16. Territory adjacent to Hong Kong occupied by Japanese troops.

17. Proposed British settlement of Palestine question criticized by League of Nations' Permanent Mandates commission as "not in accordance" with terms of mandate.

18. Germany assumed military control of Slovakia. ¶ Great Britain refused Japanese demand that it surrender store of Chinese silver and prohibit circulation of Chinese currency in Tientsin before consulting other interested nations. ¶ Aly Maher Pasha formed new cabinet in Egypt.

19. Germany and U.S.S.R. signed seven-year trade agreement. ¶ Pope Pius XII appealed to European powers not to assume "the inexpressible responsibility of . . . force."

20. Japanese blockade of British concession in Tientsin broken by Hai river floods.

21. Announcement in Berlin of 10-year nonaggression pact between U.S.S.R. and Germany caused consternation in world's capitals.

The nazi-soviet pact of nonaggression was signed on Aug. 24, 1939, at Moscow. Shown immediately after the signing of the agreement are German Foreign Minister von Ribbentrop, Joseph Stalin and Foreign Minister Molotov of Russia



23. Great Britain warned Germany, in message dated Aug. 22, that it was determined to fulfil pledges to Poland; Hitler's reply insisted upon free hand in eastern Europe. § Seven-power conference of "Oslo group" met at Brussels; King Leopold of Belgium broadcast appeal for peace. § Gen. Carlos Quintanilla assumed presidency of Bolivia after suicide of Pres. German Busch. § New world's automobile speed record of 368.85 m.p.h. established by John Cobb at Bonneville salt flats, Utah.

24. Nazi-soviet nonaggression pact signed in Moscow. I British parliament passed emergency powers bill for government to rule by decree; Chamberlain declared war imminent but still hoped for "a way out." I Roosevelt appealed to Hitler and President Moscicki of Poland to settle their controversies by direct negotiation, arbitration, or conciliation; in another message, he urged King Victor Emmanuel of Italy to intervene on behalf of peace. I Albert Forster elected head of gov't of Danzig to replace Arthur Greiser. I Louis Lepke, object of nation-wide manhunt surrendered to federal agents in New York city. I George L. Carpenter elected general of Salvation Army to succeed Evangeline Booth.

25. Hitler requested conference with Sir Nevile Henderson and, according to British White Paper of Sept. 1, told British ambassador he was "determined to abolish Macedonian conditions in Poland." ¶ Poland and Great Britain signed five-year military alliance in London. ¶ Pres. Moscicki of Poland replied to Pres. Roosevelt that his nation stood ready to negotiate directly with Germany; Roosevelt then addressed second message to Hitler asking him to adopt pacific settlement also. ¶ Japanese ambassador to Berlin ordered to file protest with German gov't against signing of nazi-soviet pact. ¶ Martial law proclaimed in Chile after abortive military revolt.

26. Sir Nevile Henderson flew to London to present Hitler's verbal message of Aug. 25 at cabinet meeting. ¶ Serbo-Croat accord granted Croatia separate parliament and established freedom of press and assembly in Yugoslavia. ¶ British and French military missions left Moscow. ¶ Rationing of food and clothing decreed throughout Germany; nazis cancelled Nürnberg party congress. ¶ Germany's ministers to Switzerland and the Netherlands and its ambassador to Belgium assured these countries that the reich would respect their neutrality in general war. ¶ Hungary rejected Rumania's proposal for nonaggression pact but offered to negotiate treaty.

27. Hitler, in reply to letter of Aug. 26 from Daladier which suggested direct negotiations between Berlin and Warsaw, demanded return of both Danzig and the Polish Corridor.

28. British cabinet completed reply to Hitler's communications of Aug. 23 and 25; as published in British White Paper of Sept. 1, this note requested direct negotiations between Germany and Poland and offered to discuss Hitler's proposal for a "general understanding" regarding the British empire after the differences between Germany and Poland had been peacefully composed. ¶ French-German frontier closed; the Netherlands mobilized; Switzerland and Belgium called up more troops. ¶ Bratislava occupied by German troops. ¶ German liner "Bremen" detained and searched for offensive weapons in New York harbour; it did not sail until Aug. 30. ¶ Gen. Nobuyuki Abe appointed Japanese premier after resignation of Kiichiro Hiranuma's cabinet. ¶ British merchant ships ordered by admiralty to leave Mediterranean and Baltic.

29. Hitler's reply to British message of Aug. 28 telephoned to London; as reported in the British White Paper of Sept. 1, it accepted British proposal for direct discus-

sions providing a Polish emissary "with full powers" should arrive at Berlin Aug. 30; Hitler denied this was an ultimatum. ¶ Poland protested German military occupation of Slovakia. ¶ Belgium and the Netherlands offered to mediate for France, Great Britain, Germany, Poland and Italy. ¶ Rationing of food and partial evacuation of larger cities ordered by Mussolini. ¶ Ivan Subovitch took office as first governor of Croatia. ¶ Pres. Roosevelt repeated his belief that failure of congress to modify U.S. neutrality act had encouraged Hitler. ¶ Gen. Shunroko Hata named minister of war in new Japanese cabinet; Premier Abe took over portfolio of foreign affairs.

30. Another message to Hitler drafted by British cabinet and delivered shortly before midnight; British White Paper of Sept. 1 revealed that note expressed willingness to initiate Polish-German discussions at earliest practicable date; in reply, German Foreign Minister von Ribbentrop read to Sir Nevile Henderson the text of 16-point proposal published in Berlin the next day. ¶ Hitler established defense council of six headed by Goering. ¶ Poland speeded up mobilization to include all qualified men between 21 and 40. ¶ German military rule proclaimed in Slovakia by Premier Josef Tiso.

31. 16-point "peace plan" published by Hitler suggested return of Danzig to Germany, retention of Gdynia by Poland, plebiscite in Polish Corridor to be held after a year, and extraterritorial communications zone through Corridor for whichever nation lost plebiscite; Polish gov't, though it did not receive formal text, pronounced the terms of the proposal unacceptable. ¶ British fleet, army and air force placed on war footing. ¶ Soviet-German pact ratified by supreme soviet; Premier Molotov said proposed mutual assistance pact with Great Britain and France had been dropped because Britain had supported Poland's objections to soviet troops on Polish soil. ¶ Slovakia demanded that Poland return Teschen area occupied after pact of Munich.

SEPTEMBER, 1939

1. Germany began invasion of Poland at 5:45 A.M. on four fronts after proclamation to army by Hitler. ¶ British-French ultimatums to Germany demanded suspension of aggressive action in Poland and withdrawal of all forces. ¶ Hitler, in address to reichstag, said Germany had "returned fire" because Poland had mobilized instead of sending emissary to discuss his proposals; he named Goering as his successor and Rudolf Hess as next in line in case "something happens to me." ¶ Danzig accepted as part of reich after Albert Forster proclaimed its reunion with Germany. ¶ Italian official communiqué stated "Italy will take no initiative whatever toward the military operations."

2. Britain and France conferred upon expiration date for joint ultimatums to Germany. ¶ Germany reported important advances in Polish Corridor and Upper Silesia. ¶ French chamber of deputies voted Daladier authority to declare war and adopted war budget of 69,000,000,000 francs; final mobilization began. ¶ Eire approved declaration of neutrality. ¶ Ernest H. Gruening appointed governor of Alaska. ¶ New perfusion pump to keep different types of animal tissue alive at same time announced by Col. Charles A. Lindbergh.

3. Great Britain declared war on Germany at 11 A.M. after setting time limit to ultimatum of Sept. 1; France entered conflict officially six hours later. ¶ British liner "Athenia," bound for Montreal, with 1,418 aboard, torpedoed 200 mi. west of the Hebrides; it sank next day;



Americans. ¶ Hitler left Berlin to join army on eastern front. ¶ Winston Churchill entered British war cabinet as first lord of the admiralty; Anthony Eden was named secretary for the dominions, without seat in cabinet, and Lord Hankey minister without portfolio; Viscount Gort appointed commander in chief of British field forces. ¶ President Roosevelt declared that every effort of his administration would be directed toward maintaining true neutrality. ¶ King George VI, in message broadcast throughout world,

total loss of life was announced later as 112, including 30

¶ King George VI, in message broadcast throughout world, asked British subjects everywhere to "make our cause their own." ¶ Australia and New Zealand announced state of war with Germany.

4. First French war communiqué announced that operations by land, sea and air had begun against Germany. § British planes bombed German fleet at Wilhelmshaven and at western entrance to Kiel canal. § Loss of Bydgoszcz (Bromberg) and Grudziadz, strategic cities of corridor, admitted by Polish general staff; Germany announced that northern corridor was completely cut off. § Gen. Franco decreed "the strictest neutrality on the part of Spanish subjects"; Yugoslavia, Bulgaria and Rumania officially proclaimed their neutrality; statement of Japanese cabinet said nation "does not intend to be involved in it."

5. Neutrality of U.S.A. proclaimed in two declarations: first was issued in accordance with international law; second was issued under terms of neutrality act of 1937 and prohibited export or transshipment of arms to belligerents. ¶ Removal of Polish capital from Warsaw to Lublin re-

Number 10 Downing street, on the morning of Sept. 3, 1939, where crowds dispersed quietly as the first air raid sounded immediately following Great Britain's declaration of war

ported as German army intensified drive on four fronts and announced virtual control of Upper Silesia. § Prime Minister Hertzog of South Africa resigned after parliament voted to sever diplomatic relations with Germany. ¶ Stocks rose 1 to 27 points in heavy trade on New York Stock Exchange. ¶ France and Poland signed protocol to treaty of alliance which prohibited either from signing separate armistice or treaty of peace.

6. Cracow occupied by Germans, who also announced capture of Kielce. ¶ French troops advanced into western Germany at several points, according to army communique which also announced debarkation of British troops in France. ¶ Union of South Africa declared war against Germany; Gen. Jan Christiaan Smuts formed war cabinet ¶ Eduard Benes and other former Czech leaders offered to form Czech legion to fight for Allies. ¶ Great Britain suspended London naval treaty of 1936 and separate naval treaties with Poland and U.S.S.R. ¶ American naval patrols established in Atlantic and Caribbean, to survey movements of belligerent fleets. ¶ Liner "Bremen" reported by Berlin safe in unidentified neutral port, later revealed as Murmansk, U.S.S.R. ¶ Iraq requested German minister to leave Baghdad.

7. Polish garrison of 77 men at Westerplatte fortress in Danzig harbour surrendered after six-day siege; German army continued "pincer" drives toward Lodz, Poznan and suburbs of Warsaw. § Fgypt officially notified Great Brit

- 8. German army advanced to outskirts of Warsaw. ¶ Limited national emergency declared by Pres. Roosevelt, who ordered increases in enlisted strength of all U.S. armed forces. ¶ Contraband bases for search of vessels established by Great Britain at Gibraltar, Kirkwall in the Orkneys, Weymouth, North Foreland and Haifa.
- 9. Field Marshal Goering declared in Berlin speech that Germany wanted nothing from France and accused England of scheming to "fight till the last Frenchman." ¶ Fall of Lodz announced by Germans.
- 10. Repulse of attack on Warsaw attributed by Germans to civilian sniping; removal of Polish capital from Lublin to Lwow reported. ¶ Canada declared war against Germany.
- 11. Poles and Germans met in fierce battle in Poznan and Lodz regions, at Warsaw, and along 250-mi. front from East Prussia to Slovakian border; Germans extended southern salient toward Lwow (Lemberg). ¶ Canadian parliament voted to appropriate initial war fund of \$100,000,000 and defeated motion to prohibit expeditionary force to Europe.
- 12. Chamberlain flew to undisclosed town in northern France to attend first meeting of Allies' supreme war council. ¶ Virtual encirclement of Warsaw reported by Germans after they had severed Warsaw-Bialystok railroad; fall of Poznan announced. ¶ Duke and duchess of Windsor's return to England, after three-year exile, announced in London.
- 13. Daladier took over foreign ministry in modification of French cabinet, transferred Georges Bonnet to ministry of justice, and created new ministry of armaments headed by Raoul Dautry. ¶ German troops pushed toward outskirts of Lwow and extended drive from East Prussia toward Brest-Litovsk. ¶ U.S. submarine "Squalus," sunk off Atlantic coast since May 23, towed to navy yard at Portsmouth, New Hampshire; 25 of its 26 dead were removed in next two days.
- 14. Gdynia surrendered after two-week siege; encirclement of Warsaw reported complete; removal of Polish capital to Zaleszczyki, on Rumanian frontier, announced in Berlin.
- 15. U.S.S.R. and Japan agreed upon truce, effective Sept. 16, to end hostilities on Manchurian and Mongolian frontiers. ¶ Germans advanced to outer fortifications of Brest-Litovsk and continued drives east of San river. ¶ Australian Prime Minister R. G. Menzies formed war cabinet of six members and announced new taxes to meet costs of war. ¶ Col. Charles A. Lindbergh, in first formal speech after 1931, broadcast appeal to Americans not to become involved in war. ¶ Loring Christie appointed Canadian ambassador to U.S.A.
- 16. German high command issued ultimatums that Warsaw either surrendor or evacuate its civilians; or otherwise suffer unrestricted bombardment; the command was unanswered; fall of Bialystok and Kutno announced in Berlin.
- 17. Soviet troops invaded eastern Poland along length of frontier after notifying Poland and assuring all powers with whom it maintained diplomatic relations that it nevertheless intended to pursue a policy of neutrality. § British aircraft carrier "Courageous" sunk by German submarine. § Capture of Brest-Litovsk announced after severe battle; thousands of Polish troops and refugees fled across Rumanian border. § Pres. Moscicki signed proclamation that Polish gov't would function "with full authority" in foreign country.
 - 18. Russian and German forces met at Brest-Litovsk,

- according to Berlin report; joint commission met to set up limits of occupation for each army; attack on Warsaw resumed; Germans announced capture of rich oil regions of Ukraine, where Russia also advanced westward to Stanislawow. ¶ Polish gov't fled country; Pres. Moscicki, Foreign Minister Beck and Marshal Smigly-Rydz arrived at Cernauti, Rumania. ¶ Premiers and foreign ministers of Denmark, Finland, Norway and Sweden met at Copenhagen to outline program of neutrality.
- 19. Hitler at Danzig repeated he had no claims against France and Great Britain, but declared Germany and Russia had agreed that "Poland will never rise again in the form of the Versailles treaty." ¶ Russian troops occupied Vilna and continued advances in White Russia and Ukraine.
- 20. Complete elimination of Poznan-Kutno pocket after furious nine-day battle announced by German high command; Berlin also announced arrival of Gen. von Brauchitsch, commander in chief of army, at western front and transfer of many divisions from Poland to Westwall. ¶ Rumanian gov't announced Marshal Smigly-Rydz would be interned for duration of World War II.
- 21. Repeal of U.S. arms embargo asked by Pres. Roosevelt in message to special session of congress; he said he regretted having signed neutrality act of 1937. ¶ Iron Guard assassins of Rumanian Premier Calinescu were executed on the site, and new temporary cabinet of Gen. George Argesanu ordered execution or imprisonment of hundreds of other Iron Guardists during next two days. ¶ Russian troops announced occupation of Lwow after withdrawal of German besiegers, but Germany claimed capture of city Sept. 22.
- 22. Frontier areas reported partially flooded by Belgium and the Netherlands as experimental precaution against German invasion. ¶ All elections in Great Britain suspended for duration of war.
- 23. Conquest of Poland completed, declared German high command; Poles continued organized resistance at Warsaw and Modlin, and on Hela peninsula. ¶ Mussolini reaffirmed Italy's neutrality, in his first speech after May 20; he said that since the Allies had not declared war on Russia they should also face "the German fait accompli" in Poland. ¶ Pan-American conference on neutrality convened at Panama city. ¶ Recapture of Kaoan claimed by Chinese. ¶ War appropriations up to 15,000,000,000 marks decreed by German defense council. ¶ Hungary resumed diplomatic relations with U.S.S.R., ruptured since Feb. 2. ¶ Adm. Kichisaburo Nomura appointed Japanese foreign minister.
- 24. Half of Warsaw in flames and 1,000 civilians killed after intense 24-hr. bombardment, according to Polish dispatches. ¶ Major Japanese offensive in Kiang-si and Hunan provinces along 70-mi. front announced in Tokyo.
- 25. Soviet troops concentrated on Estonian border as Foreign Minister Karl Selter returned to Tallinn after hurried conference in Moscow.
- 26. French Communist party dissolved by decree of cabinet. ¶ Removal of all known communists from U.S. governmental positions had been ordered by administration, according to Rep. Martin Dies (Dem., Tex.). ¶ Disbandment of War Resources board announced by Pres. Roosevelt.
- 27. Warsaw surrendered unconditionally after 20 days of siege; German troops began occupation of city Oct. 1. ¶ Basic rate of British income tax raised to 37.5%—highest in history—for 1940–41 fiscal year, to meet £2,000,000,

ooo war budget. ¶ Col. Gen. von Rundstedt named military administrator of German occupation in Poland; Hans Frank appointed civil administrator.

28. Constantine Argetoianu appointed Rumanian premier to succeed Gen. Argesanu, temporary head of gov't after assassination of Premier Calinescu Sept. 21. ¶ Polish fortress at Modlin, near Warsaw, surrendered unconditionally. ¶ Independence of India at end of World War II demanded by Gandhi. ¶ Raymond J. Kelly of Detroit elected national commander of American Legion. ¶ Acceptance of Lhamo Dhondup, five-year-old Chinese boy, as 14th dalai lama of Tibet after meeting of secret council in Lhasa; he was later named Lingerh Lamutanchu.

29. Russo-German frontier agreement signed in Moscow; protocol statement declared both nations would try to persuade England and France to make peace with Germany, but would consult on "necessary measures" if Allies refused. ¶ Estonia concluded treaty of "mutual assistance" with U.S.S.R. which permitted soviets to establish naval and air bases on Dagoe (Hiiu Maa) and Oesel (Saare Maa) islands and at port of Paldiski, also to maintain troops on Estonian soil; pact was ratified at Tallinn Oct. 4. ¶ William Z. Foster, chairman of U.S. Communist party, declared party would not support U.S.A. if it entered war on side of Allies. ¶ Dissolved Communist party of France reorganized and adopted new name—French Workers and Peasants group.

30. Ignace Moscicki resigned as president of Poland in favour of Wladislaw Raczkiewicz; Gen. Wladislaw Sikorski named premier of gov't, resident in France. ¶ Permanent Pan-American advisory committee of 21 established at Panama city, to sit in Washington for duration of war.

OCTOBER, 1939

- 1. Winston Churchill condoned Russia's actions in Poland and Baltic states as necessary to its "national interest"; he praised the "great and friendly nation of Italy." ¶ Conscription of 250,000 new troops between 21 and 22 ordered by British royal proclamation. ¶ Last regular centre of Polish military resistance disappeared with surrender of troops on Hela peninsula. ¶ Chinese troops captured Japanese positions along Hong Kong border in surprise attack.
- 2. U.S.A. would withhold recognition of Polish conquest and continue relations with new Polish gov't in France, declared Sec'y of State Hull. ¶ Safety zone with average width of 300 mi. around all coasts of western hemisphere except those of Canada and European possessions proclaimed by 21 republics in Declaration of Panama. ¶ U.S. merchant vessels must submit to halt and search, Berlin notified Washington.
- 3. Conference of 21 American republics closed at Panama city. ¶ Japanese war office admitted casualties of 18,000 killed, wounded and sick during border conflicts with Russia between May 11 and Sept. 16.
- 4. American merchantmen warned by Sec'y of State Hull to avoid sea routes near belligerent nations. ¶ French infantrymen occupied Borg forest east of Moselle river after tank battle. ¶ Committee of British dominion cabinet ministers to sit in London and co-ordinate war plans announced by Anthony Eden.
- 5. Latvia granted U.S.S.R. right to establish naval and air bases at Liepaja (Libau) and Ventspils (Windau) and to fortify Latvian coast; treaty of mutual assistance signed at Moscow. ¶ Pres. Roosevelt made public a warning from German Grand Admiral Raeder that U.S. passenger ship

- "Iroquois" would be sunk near American coast, presumably by Allies; the "Iroquois" docked safely at New York city Oct. 11. ¶ Grover C. Bergdoll, U.S. draft evader, sentenced to three additional years in prison.
- 6. Hitler, in address to reichstag, asked for "unconditionally guaranteed peace" but declared "this statement will have been my last"; he announced German casualties in Poland were 10,572 killed, 30,322 wounded, 3,404 missing. ¶ Chungking celebrated defeat of Japanese in vicinity of Changsha as "biggest victory of war"; Japanese later conceded defeat.
- 7. Repatriation program for Germans in Baltic states initiated by reich's ministers to Latvia and Estonia. ¶ Finland called up additional reservists as U.S.S.R. issued invitation for conference at Moscow.
- 8. Japanese entered Shekki, on delta of Canton river. ¶ New York Yankees defeated Cincinnati Reds in fourth straight game (2-1, 4-0, 7-3, 7-4) to win baseball world's series
- 9. Finland continued to mass troops on eastern border as its representative, Juhu Paasikivi, entrained for Moscow.
- 10. Third Baltic pact, with Lithuania, concluded at Moscow; U.S.S.R. ceded Vilna in exchange for practically unlimited rights to establish military bases on Lithuanian soil: Lithuania ratified pact Oct. 14. ¶ Civilian evacuation of Helsinki and Viborg and mobilization of fleet ordered by Finnish gov't.
- 11. Anglo-Soviet trade treaty concluded; it provided for exchange of Russian timber for British rubber and tin. ¶ Pres. Roosevelt dispatched personal note to Pres. Kalinin, urging U.S.S.R. not to disrupt its friendly relations with Finland.
- 12. William Green re-elected unanimously for 15th consecutive term as president of A.F. of L.
- 14. British battleship "Royal Oak" sunk at Scapa Flow by German submarine which penetrated defenses of bay.
 - 15. Soviet warships anchored in Tallinn bay.
- 16. Nazi planes raided British naval base at Rosyth on Firth of Forth. ¶ Madrid restored as capital of Spain.
- 17. Russo-Turkish negotiations broke down; Turkish Foreign Minister Saracoglu left for Ankara Oct. 18. ¶ Scapa Flow raided twice by nazi planes. ¶ Pres. Kalinin's reply of Oct. 16 to Pres. Roosevelt's message of Oct. 11 revealed in Washington; note described Russian negotiations with Finland as entirely friendly. ¶ Elmer F. Andrews resigned as U.S. wages and hours administrator; he was succeeded by Col. Philip Fleming.
- 18. Kings of Sweden, Norway and Denmark and Pres. Kyösti Kallió of Finland opened four-power conference at Stockholm to consult on possible concerted action in case of Russian invasion of Finland. ¶ Belligerent submarines barred from U.S. ports and territorial waters by proclamation of Pres. Roosevelt. ¶ Dominion status for India by gradual constitutional steps after war described by Viceroy Linlithgow as British objective.
- 19. Allied-Turkish pact of mutual assistance signed at Ankara; protocol specified that Turkey should not be obliged to fight Russia. § Formal annexation of 20,000 sq.mi. of Polish territory taken from Germany by treaty of Versailles announced in Berlin; decree was signed Oct. 8, effective Nov. 1. § U.S. Ambassador Joseph C. Grew, in speech at Tokyo, sharply criticized Japanese infringements of U.S. rights in China.
- 20. Polish gov't in France announced protest to Lithuania against annexation of Vilna. ¶ Japanese fliers completed round-the-world flight at Tokyo.
 - 21. Editorial in Izvestia of Moscow declared Allied-

- Turkish pact had "serious political significance" and warned against attempts to drive a wedge between Germany and U.S.S.R. ¶ German planes made first attack on British convoy in North sea.
- 22. Withdrawal of French troops from all but scattered posts in German territory reported in Paris. ¶ India congress ordered eight provincial ministries to resign as protest against Britain's policy of postponing grant of dominion status.
- 23. Seizure of U.S. ship "City of Flint" as contraband carrier by German crew on Oct. 9 announced; Germans took vessel with crew of 41 to Tromsoe, Norway, Oct. 20, then to Murmansk, U.S.S.R.
- 24. "Germany will now fight to the finish," asserted German Foreign Minister von Ribbentrop at Danzig. ¶ Minimum U.S. wages in interstate industry raised to 30 cents per hour and maximum working hours per week without overtime pay lowered to 42; approximately 700,000 workers were affected.
- 25. Gov't of Premier Duplessis of Quebec, opponent of conscription, defeated by Liberals in landslide vote.
- 26. Russia notified London that it would not recognize validity of British contraband list. ¶ German pocket battleship "Deutschland" had elu¶ed British blockade to raid shipping in Atlantic, Prime Minister Chamberlain disclosed in house of commons; raiding by "Admiral Scheer" in Atlantic admitted by naval authorities next day. ¶ Release of "City of Flint" demanded of U.S.S.R. by U.S. state dept. ¶ Josef Tiso elected first president of Slovak republic.
- 27. Soviet rule for western Ukraine approved unanimously by assembly at Lwow. ¶ Lithuanian troops began occupation of Vilna.
- 28. "City of Flint" left Murmansk, manned by German crew.
- 29. Soviet troops entered Latvia to occupy military and naval posts.
- 30. Mixed claims commission awarded U.S. litigants \$50,000,000 for damages in Black Tom and Kingsland explosions. ¶ Winnie Ruth Judd, escaped murderess, captured at Phoenix, Ariz.
- 31. New foreign policy of U.S.S.R. outlined by Premier-Foreign Minister Molotov at extraordinary session of supreme soviet; he accused Allies of prolonging war, defended Russian invasion of Poland, deplored the "experience of Versailles," berated the U.S. gov't for intervening in Finnish negotiations and for supporting repeal of arms embargo, conciliated Japan, and divulged Russia's "proposals" to Finland, viz., islands in the Gulf of Finland, naval base at the entrance to the gulf, and a strip of territory on the Karelian isthmus north of Leningrad in exchange for part of soviet Karelia. ¶ Six Italian cabinet ministers, chiefs of army and air force, and Party Sec'y Achille Starace removed from office by Mussolini; Ettore Muti became new party sec'y, and Marshal Rodolfo Graziani chief of staff of the army. I New York world's fair of 1939 closed with paid admissions of 25,814,953.

NOVEMBER, 1939

- 1. Finland declared it would not accede to "proposals" set forth in V. Molotov's speech of preceding day. ¶ Admission of Polish western Ukraine into U.S.S.R. voted unanimously by supreme soviet; Polish White Russia was admitted next day.
- 2. Strike against coastwise shipping lines called in New York city
- 3. Molotov's references of Oct. 31 to U.S.A. characterized by President Roosevelt as bad manners.

- 4. Bill repealing U.S. arms embargo and substituting "cash-and-carry" trade with belligerents signed by Pres. Roosevelt; proclamation forbade U.S. ships to enter waters around Great Britain and Deland, English channel, North sea south and west of Beigen, Baltic sea, and Bay of Biscay except northern Spanish coast. ¶ "City of Flint" released to U.S. crew by Norway, which interned German prize crew for entering port of Haugesund without permission; Germany protested to Norwegian gov't; ship sailed to Bergen.
- 5. Marshal Pietro Badoglio reconfirmed as chief of Italian armed forces; increase in Italian army ordered by Mussolini. ¶ Norway rejected nazi demand for return of "City of Flint" and release of prize crew. ¶ Canadian C.I.O. declared complete independence from U.S. parent organization and pledged war aid to dominion.
- 6. A decadent capitalism was responsible for World War II, said V. Molotov.
- 7. King Leopold of Belgium and Queen Wilhelmina addressed another joint offer of mediation to Germany, Britain, and France.
- 8. Apparent attempt to assassinate Hitler and nazi leaders failed when he left Buergerbraeu hall, Munich, with his party shortly before time bomb exploded, wrecking hall and killing eight. ¶ Unsuccessful conspiracy to start revolt in Afghanistan Sept. 7 revealed in India.
- 10. Breakdown of Finnish-Russian parleys announced in Moscow.
- 11. American shipping to Norway resumed.
- 12. Reply of King George VI to Dutch-Belgian offer of mediation in war insisted upon guarantees against recurring German aggression. ¶ Withdrawal of British troops from north China announced in London; France announced similar move Nov. 14.
- 13. German envoys to Belgium and Netherlands instructed to assure two countries that reich intended to respect their neutrality. ¶ Shetland Islands bombed twice by German planes.
- 14. Byrd expedition left Boston on first leg of journey to Antarctica.
- 16. General Motors Corp. and 3 subsidiaries convicted of violating antitrust act; 17 executives of companies were acquitted. ¶ Al Capone, former Chicago gangster, released from prison.
- 17. Nine Czech students executed at Prague for taking part in anti-German riots; three more Czechs were shot next day; University of Prague closed for three years. ¶ Allied Supreme Economic council created in London to co-ordinate Franco-British purchasing, shipping and blockade activities. ¶ Two-week strike of longshoremen in New York city ended. ¶ Capture of Pakhoi in south China announced by Japanese.
- 19. Unrestricted German mine warfare charged by Great Britain. ¶ Hindu-Moslem riots broke out in Sukkur, India.
- 20. Chiang Kai-shek elected president of Chinese executive yuan to succeed H. H. Kung, who became vice-president. ¶ Fritz Thyssen, German industrialist, announced that his opposition to nazis' war policy had obliged him to flee to Switzerland.
- 21. German exports, whether on reich's or neutral ships, would be seized in retaliation for Germany's mine-laying in North sea, announced Prime Minister Chamberlain. ¶ Two British Intelligence Service officers and a German were said by Heinrich Himmler to be instigators of Buergerbraeu explosion Nov. 8; all were arrested within a few hours and the German later confessed crime, said Himmler,

who also accused Otto Strasser, head of anti-nazi Black Front, as brains behind plot.

- 23. British armed merchantman "Rawalpindi" sunk by German pocket battleship "Deutschland" and another warship off Iceland in first naval battle of war. ¶ Sowing of parachuted magnetic mines by German seaplanes in estuary of Thames confirmed by British admiralty. ¶ Premier Argetoianu of Rumania resigned; George Tatarescu formed cabinet next day.
- 24. Plan to cut 1940 deficit by more than half for 1941 fiscal year divulged by Pres. Roosevelt, who also announced likely increase of \$500,000,000 in appropriations for national defense. ¶ Capture of Nanning announced by Japanese army.
- 26. Withdrawal of Finnish troops 20 to 25 km. behind fortified border on Karelian isthmus demanded by U.S.-S.R.; Finland said next day it would agree to proposal only if soviet troops withdrew from border also.
- 27. Order in council for blockade of German exports signed by King George.
- 28. Finnish-Soviet nonaggression pact denounced by U.S.S.R. ¶ Strike of C.I.O. workers at Chrysler plants in Detroit ended after 54 days.
- 29. U.S.S.R. severed diplomatic relations with Finland; United States offered to mediate. ¶ Fritz Kuhn convicted of larceny and forgery; he was sentenced Dec. 5 to 2½-5 years in prison. ¶ Joseph Stalin branded as lie statement attributed to him that World War II "should last as long as possible." ¶ Rumanian Foreign Minister Cafencu rejected Hungarian Foreign Minister Csaky's suggestion that Rumania consider return of Transylvania.
- 30. Russian troops began invasion of Finland shortly after 9 A.M.; Soviets announced capture of Petsamo (Petschenga) and four islands in Gulf of Finland. ¶ Dino Grandi named president of Italian chamber of fasces and corporations.

DECEMBER, 1939

- 1. Finnish Premier Cajander resigned despite vote of confidence and was succeeded by Risto Ryti; new soviet puppet "People's government" set itself up at Terijoki and was recognized by U.S.S.R. ¶ Pres. Roosevelt denounced soviet invasion as wanton and lawless.
- 2. Finns reported recapture of Petsamo and successful counterattacks on Karelian isthmus south of Mannerheim line.
- 4. Moscow refused Finland's proposal to negotiate; Finns announced capture of 1,500 soviet troops north of Lake Ladoga; *Pravda* admitted Russian advance had been delayed by land mines.
- 5. Finland claimed destruction of 60 Russian planes in raid on soviet air bases near Murmansk but admitted short retreats on Karelian isthmus and in vicinity of Suojaervi. ¶ Plan for using Finland's war debt payment of \$234,693 Dec. 15 to aid nation in repelling invasion announced by Pres. Roosevelt.
- 6. Ruin of reich's overseas trade admitted by German economic and colonial expert. ¶ Secretary of German consulate in New York city found beaten to death. ¶ Col. Fulgencio Batista retired from Cuban army to become candidate for presidency.
- 8. U.S.A. protested to Great Britain against seizure of German exports on U.S. ships. ¶ Admiral James O. Richardson appointed commander in chief of U.S. fleet. ¶ Manuel Prado inaugurated as president of Peru.
 - 10. Credit of \$10,000,000 granted Finland by U.S. Ex-

port-Import bank. ¶ Tass, official soviet news agency, published report that Germany was shipping arms to Finland; report was officially denied in Berlin.

- 11. League of Nations asked U.S.S.R. to suspend hostilities in Finland and submit dispute to negotiation; reply requested within 24 hr.; U.S.S.R. refused next day. ¶ Evidence in U.S. criminal trials obtained by wire-tapping was barred by supreme court.
- 12. "Bremen" returned to home port from Murmansk after eluding British submarine. ¶ Finns claimed 2,000 Russians slain in soviet offensive to cut nation in two. ¶ Swedish Foreign Minister Sandler, object of nazi and Russian criticism, dropped from new coalition cabinet, which took office Dec. 13.
- . 13. German pocket battleship "Admiral Graf Spec" disabled after running battle with British cruisers "Ajax," "Achilles" and "Exeter"; it took shelter in harbour of Montevideo, Uruguay. ¶ Russia named as aggressor by committee of 13 appointed by League of Nations assembly. ¶ Marcel Pilet-Golaz elected president of Swiss confederation for 1940.
 - 14. U.S.S.R. expelled from League of Nations.
- 16. "Admiral Graf Spee" ordered by Uruguayan gov't to leave by 8 p.m. Dec. 17.
- 17. On Hitler's orders, "Admiral Graf Spee" was blown up by her commander outside harbour of Montevideo.

 § First Canadian troops arrived in Great Britain.
- 18. British and German planes met in air battle over Heligoland Bight. ¶ Winston Churchill claimed sinking of German cruiser in mouth of the Elbe. ¶ Argentina announced it would intern crew of "Admiral Graf Spee."
- 19. German luxury liner "Columbus" scuttled by own crew 450 mi. off U.S. coast when intercepted by British destroyer; German freighter "Arauca" took refuge at Ft. Lauderdale, Fla., after pursuit by British cruiser "Orion."
- 22. Russians continued retreats on northern and eastern Finnish fronts; unofficial estimates placed soviet casualties at 30,000 for first three weeks of war.
- 23. Roosevelt named Myron C. Taylor his personal representative at Vatican. ¶ All American republics protested jointly to France, Great Britain and Germany against violation of 300-mi. "safety zone" around hemisphere.
- 24. Five-point peace plan of Pope Pius XII called for guarantee of all nations' independence, disarmament, return to international morality and meeting of "just demands of nations and . . . minorities." ¶ Irish Republican army members raided magazine of Dublin fort.
- 25. Finnish troops crossed Russian border for first time in drive to sever Murmansk railway; Viipuri suffered heavy long-range artillery bombardment.
- 30. Charles Edison appointed U.S. sec'y of navy. ¶ Finns routed Russians in two-day battle north of Lake Kianta: entire Russian division reported annihilated.
- 31. Disputes over fishing grounds and Manchurian rail-road settled by two Russo-Japanese pacts.

JANUARY, 1940

- 1. Vladimir Sokoline, under-sec'y general of the League of Nations, only Russian on the staff, was dismissed.
- 2. The U.S. supreme court, in a unanimous decision, ruled that there could be no appeal to the courts from a decision of the National Labor Relations board designating the union which was to negotiate with an employer. ¶ Cordell Hull, U.S. sec'y of state, made a formal protest to Great Britain against the removal from British and neutral vessels on the high seas of American mail addressed to neutral countries.

- 3. Pres. Roosevelt in his annual message to congress said that the nation was committed to peace.
- 4. Pope Pius XII appointed the Most Rev. Samuel A. Stritch, archbishop of Milwaukee, to succeed the late Cardinal Mundelein as archbishop of Chicago. ¶ Pres. Roosevelt in his budget message recommended the expenditure of \$8,424,000,000 for the fiscal year 1941, including \$1,800,000,000 for national defense, advised raising \$460,000,000 by new taxes and estimated the deficit at \$1,716,000,000. ¶ Pres. Roosevelt nominated Attorney General Frank Murphy to succeed the late Pierce Butler as associate justice of the supreme court and Solicitor General Robert H. Jackson to succeed Mr. Murphy in the cabinet.
- 5. Leslie Hore-Belisha, sec'y of state for war in the British cabinet, resigned and was succeeded by Oliver Stanley. ¶ Premier Hubert Pierlot of Belgium submitted his resignation to the king and was immediately commissioned to form a new cabinet.
- 8. U.S.A. and Australia announced establishment of direct diplomatic relations. ¶ Rationing of bacon, ham, butter and sugar began in Great Britain.
- 10. House of representatives passed Gavagan anti-lynching bill by vote of 252 to 131 with 124 Democrats voting against it.
- 12. Pres. Cárdenas of Mexico declared that Monroe Doctrine ceased to exist in its original form when the American republics agreed in 1936 to protocol against intervention by one country in affairs of another.
- 13. It was announced in Sofia that Bulgaria and Turkey had reached an agreement for maintenance of peace and neutrality in the Balkans.
- 14. Gen. Nobuyuki Abe, Japanese premier, resigned and Adm. Mitsumasa Yonai was commissioned to form a new cabinet. ¶ Federal Bureau of Investigation announced the arrest in New York of 18 members of so-called Christian Front, charged with "plotting to overthrow the gov't of the U.S."
- 15. British foreign office, in formal answer to the American nations which decreed neutrality zone extending 300 mi. around western hemisphere, declared that it was impractical to enforce neutrality in the zone.
- 16. Rear Adm. Byrd notified the navy department that his ships, the "Bear" and "North Star," had arrived at the Bay of Whales in Little America in the Antarctic.
- 18. A trade treaty between France and Spain was signed in Madrid. ¶ 30,000 Russians reported retreating from the Salla sector in Finland after an unsuccessful attempt to force their way through to the Gulf of Bothnia.
- 19. French senate approved by unanimous vote bills passed by chamber of deputies Jan. 16, excluding from parliament and municipal gov't all communists who had not withdrawn from that party before Oct. 26.
- 20. Great Britain refused to abandon practice of examining mail addressed to neutral countries, carried in U.S. or neutral ships.
- 22. Earl Browder, see'y of U.S. Communist party, convicted of obtaining passport by fraud, sentenced to four years' imprisonment and fined \$2,000. ¶ Ignace Jean Paderewski elected president of the Polish gov't set up by exiles in France.
- 24. John L. Lewis, in address at United Mine Workers' annual convention in Columbus, O., said that the national administration had broken faith with labour and that Pres. Roosevelt would be ignominiously defeated if he ran for a third term.
- 25. The Canadian parliament met, listened to speech from throne and adjourned to enable gov't to appeal to

- country for approval of its war policy which had been severely criticized.
- 26. U.S.-Japanese trade treaty, denounced by the U.S.A. July 26, 1939, expired at midnight.
- 27. Russian attempt to get behind the Mannerheim line around Lake Ladoga with 70,000 men repulsed by the Finns. ¶ A decree issued in Madrid restored to the Jesuits the property in Spain confiscated by the gov't in 1932.
- 31. Pres. Cárdenas of Mexico announced that it was the intention of the gov't to pay the oil companies for their property which it had expropriated. ¶ Joint Soviet-Mongolian and Japanese-Manchurian boundary commission announced failure to agree on a boundary between Mongolia and Manchuria.

FEBRUARY, 1940

- 1. Pres. Kyösti Kallió of Finland in an address to parliament said that Russia's "barbarous attacks" upon his country were senseless and that he was ready to negotiate an honourable peace.
- 4. Foreign ministers of Rumania, Greece, Turkey and Yugoslavia, meeting in Belgrade, agreed to extend existing entente for seven years. ¶ The U.S.A. entered into diplomatic relations with Saudi Arabia for the first time.
- 5. Governing body of International Labour Organization, sitting in Geneva, declared the seat of the Russian delegate vacant.
- 7. Two members of the outlawed Irish Republican army were hanged in Birmingham, England.
- 8. Turkish gov't took possession of the Krupp shipyard at Istanbul.
- 10. French chamber of deputies, after discussing in secret for two days the war policy of the gov't, gave Premier Edouard Daladier a unanimous vote of confidence.
- 11. When the convention of the American Youth congress refused to expel communist members the formation of a new youth organization composed of associations with 2,000,000 members opposed to communism was announced.
- 12. 30,000 troops from Australia and New Zealand landed at Suez, bringing to 570,000 the number of British and French troops in the near east.
- 14. Foreign Minister Tanner of Finland sent notes to all friendly gov'ts charging the Russians with violating all the rules of civilized warfare.
- 15. Japan called upon Gen. Chiang Kai-shek to surrender since its armies had conquered enough Chinese territory to support the independent gov't which it was trying to set up under Wang Ching-wei. ¶ Bogdan Philoff was directed to form new Bulgarian cabinet.
- 16. Crew of British destroyer boarded German prison ship "Altmark" in Norwegian territorial waters and after brief fight rescued 299 British seamen taken from ships sunk by "Graf Spee"; Germany filed sharp protest with Norway, which in turn protested to British gov't.
- 18. Pres. Estigarribia of Paraguay announced that he had assumed dictatorial powers.
- 19. King Gustavus V said Sweden could not send its army into Finland, as active military intervention would mean war with Russia.
- 20. French chamber of deputies expelled 60 communist members.
- 21. Capture of town and fortress of Koivisto claimed by Russians in 21st day of assault on Mannerheim line.
- 22. Sweden demanded from Russia full reparation for the bombing of the Swedish village of Pajala Feb. 21.

- ¶ Lingerh Lamutanchu, six-year-old Chinese boy, was enthroned in Lhasa, Tibet, as the 14th dalai lama. ¶ Two bomb explosions in London charged to the Irish Republican army injured 28.
- 23. British-French squadron of warships began blockade of the north coast of Norway, Sweden and U.S.S.R.
- 24. Turkish Supreme Defense council declared a state of emergency throughout the republic. ¶ Prime Minister Chamberlain, speaking in Birmingham, said that the British war aims included guaranteed independence of the Poles and the Czechs. ¶ A law suppressing Freemasonry and limiting the activities of other secret societies was approved by the Spanish cabinet.

25. Foreign ministers of Sweden, Norway and Denmark, meeting in Copenhagen, decided that the three Scandinavian nations would act as a unit in all negotiations

with belligerents.

26. Sumner Welles, U.S. undersec'y of state, seeking information in Europe, had what was described as a satisfactory interview with Premier Mussolini in Rome.

27. British admiralty announced that the battleships "Barham" and "Nelson," about whose fate there had been no public report, were repaired and again in active service.

- 28. British gov't issued orders prohibiting Jews from buying land in one part of Palestine and restricting their purchases in another part. ¶ The sarcophagus of Psusennes I, supposed to be the father-in-law of King Solomon, was opened at San el-Hagar, Egypt, revealing treasures rivalling those found in the tomb of Tutenkhamon.
- 29. French cabinet ordered issuance of food rationing cards.

MARCH, 1940

- 1. Prohibition against the practice of their professions by Jews in Italy, save to serve their fellow Jews, went into effect. ¶ Congress increased the capital of the Export-Import bank by \$100,000,000 to enable it to make loans to friendly countries to buy nonmilitary supplies; loans of \$20,000,000 to Finland, \$15,000,000 to Sweden and \$10,000,000 to Norway were authorized by the Federal Loan administrator.
- 2. Pres. Roosevelt announced that the 21 American republics were agreed to a joint defense of the Panama canal in case of war. ¶ Of three German merchant ships trying to run the British blockade of the Island of Aruba in the Dutch West Indies, one was sunk, another captured and the third driven back to port.
- 3. Undersec'y of State Welles left Berlin after interviews with Foreign Minister von Ribbentrop, Chancellor Hitler, Field Marshal Goering and Rudolf Hess, head of the nazi party.
- 4. Archduke Otto, pretender to the throne of Austria, arrived in the U.S.A. ¶ Pres. Roosevelt signed the act extending for four years the farm mortgage moratorium.
- 5. In spite of a vigorous Italian protest against interference with the shipment of coal from Germany to Italy, Allied blockading ships seized several coal-laden Italian vessels.
- 6. 20 British soldiers were killed and 16 taken prisoner in the Mersig sector of the French frontier in what was described as the first British-German infantry engagement of the war.
- 7. Federal Loan administration authorized loans of \$20,000,000 to China, \$10,000,000 to Denmark and \$1,000,000 to Iceland. ¶ France summoned to the colours all naturalized Frenchmen in the U.S.A. under the law of

- 1927 which forbade a Frenchman to change his nationality without the consent of the department of justice. ¶ The unfinished 85,000-ton British passenger ship "Queen Elizabeth" arrived in New York.
- 8. Spokesman for Japanese foreign office described U.S. loan of \$20,000,000 to China as an unfriendly act.
- 9. Great Britain released seized Italian coal ships with their cargoes on the promise of Italy not to send any more ships to Germany for coal.
- 10. Undersec'y of State Welles left Paris after having interviews with the president of France, the premier and several other officials.
- 11. Prime Minister Chamberlain announced that, if they were asked, Great Britain and France would proceed immediately to help Finland with all their available resources. ¶ Foreign Minister von Ribbentrop of Germany interviewed Pope Pius XII following talk with Mussolini March 10.
- 12. A treaty of peace between Russia and Finland was signed in Moscow under which Finland ceded to Russia Viipuri (Viborg), all the territory around Lake Ladoga and leased the Hango and Ribachi peninsulas. ¶ Great Britain floated its first large war loan of £300,000,000.
- 14. Finnish foreign minister in radio address said that Norway and Sweden had denied a formal request from Great Britain and France to permit troops to cross Scandinavian territory for the relief of Finland. ¶ Undersec'y of State Welles, who arrived in London on March 10 and interviewed the king, the prime minister and other important public men, left for Rome.
- 15. Finnish diet ratified the peace treaty with Russia by a vote of 145 to 3. ¶ Finnish foreign ser'y in a radio address said that 450,000 of the 500,000 Finns living in the territory ceded to Russia were abandoning their homes and moving into Finnish territory.
- 18. Chancellor Hitler of Germany and Premier Mussolini of Italy conferred for more than two hours at Brennero in Brenner pass.
- 19. Rioting in Lahore, India, by Moslems protesting against an order restricting the carrying of weapons resulted in the death of 29 and serious injury to 39 others.
- 20. French chamber of deputies refused to give a vote of confidence to Premier Daladier and he resigned. ¶ Praesidium of the supreme soviet in Moscow ratified peace treaty with the Finns. ¶ All-India Nationalist congress, in session in Ramgarh, adjourned after authorizing Mohandas K. Gandhi to direct the program for national independence.
- 21. Sec'y of State Cordell Hull reprimanded Cromwell, U.S. minister to Canada, for "unneutral speech" in Toronto on March 9. ¶ Paul Reynaud succeeded Edouard Daladier as premier of France; Daladier named minister of defense and war.
- 26. Pres.-elect Guardia of Costa Rica, in the U.S. on a good-will mission, was entertained in Washington by Pres. Roosevelt. J It was announced in Mexico City that by presidential decree of Feb. 28, 1,500,000 ac. of land held by three American corporations had been expropriated.
 - 27. Russia recalled its ambassador from France.
- 28. Undersec'y of State Sumner Welles returned from Europe and made a report to the president in Washington. ¶ Allied supreme war council met in London and resolved that neither France nor Great Britain would make a separate peace. ¶ Pres. Roosevelt signed bill increasing from two to ten years' imprisonment the maximum penalty for espionage against the U.S.A.
- 29. Premier-Foreign Sec'y Molotov, addressing supreme soviet, said that Russia was determined to remain neutral.

- 30. Wang Ching-wei set up puppet gov't in Nanking under the protection of the Japanese army. ¶ New York court ordered the board of higher education to revoke the appointment of Bertrand Russell to a professorship in the College of the City of New York because of his "immoral and salacious attitude toward sex."
- 31. President of the All-India Moslem league proposed the separation of the Moslem and Hindu states into independent federations.

APRIL, 1940

- 1. New Zealand's pension plan, providing at the start \$60 a year for all persons 65 years old or over, went into effect.
- 2. Pres. Roosevelt reported to congress that he had ordered the consolidation of bureaus in the treasury and agricultural departments, and the transfer of the bureau of fisheries and the bureau of biological survey to the department of the interior.
- 3. The earl of Athlone was appointed governor general of Canada to succeed the late Lord Tweedsmuir. ¶ Russian parliament approved a defense budget for the year of 56,000,000,000 rubles. ¶ 36 expelled communist members of the French chamber of deputies were convicted by a military court of spreading treasonable propaganda and sentenced to imprisonment for five years. ¶ Attorneygeneral of Ontario said that Canada should do all in its power to bring the U.S.A. into the war.
- 7. U.S. Socialist national convention, meeting in Washington, nominated Norman Thomas of New York for president and Maynard C. Krueger of Illinois for vice-president.
- 8. Great Britain and France planted mines in Norwegian territorial waters to prevent the free movement of German freight ships.
- 9. German troops entered Denmark and Norway professedly to protect those countries from France and Great Britain and announced that resistance "would be broken by all means." Norway declared war on Germany and moved the capital from Oslo; British fleet fought Germans off the coast of Norway and Norwegian army resisted nazi advance on land. ¶ Sec'y of State Hull published note presented to the Mexican ambassador April 3, proposing that all outstanding disputes between the two countries be settled by arbitration.
- 10. Pres. Roosevelt ordered extension of the area prohibited to American shipping, save under special rules, to include the sea around Norway as far north as Spitzbergen.
- 12, Pres. Roosevelt signed bill extending to June 12, 1943, the authority of the sec'y of state to negotiate reciprocal trade treaties with other nations.
- 13. German commander in Norway called on Norwegians to submit under penalty of death.
- 15. Pres. Roosevelt, addressing Pan American union, said that peace of the western hemisphere could be preserved "only if we are prepared to meet force with force if challenge is ever made."
- 17. Adm. Stark, chief of naval operations, told the senate naval affairs committee that the U.S.A. should have the most powerful navy in the world. ¶ Sec'y of State Hull announced that any forceful alteration of the status quo of the Netherlands Indies would be prejudicial to the security of the entire Pacific region.
- 18. A spokesman for Japan said that country was in agreement with Sec'y of State Hull's statement regarding the Netherlands Indies.
 - 19. The Netherlands premier announced that a state of

- siege had been ordered throughout the country.
- 20. Pres. Roosevelt declared that the Democratic party could win in Nov. 1940 only by nominating "a liberal pair of candidates."
- 23. Sir John Simon, British chancellor of the exchequer, submitted to parliament a budget of £2,667,000,000.
- 24. Josef Terboven named administrator of Germanheld areas in Norway; nazis continued advances north of Oslo and Trondhjem.
- 25. First general conference of the united Methodist Protestant and Methodist Episcopal churches met in Atlantic City, N.J. ¶ U.S. neutrality laws were applied to Norway by presidential proclamation.
- 26. British admitted Germans had "taken the first trick" in Norway; nazis captured Röros:
- 27. Foreign Minister von Ribbentrop exhibited what purported to be documentary evidence that the British planned the invasion of Norway and had troops on the way with Norwegian consent before the reich acted; Sir Samuel Hoare characterized the charge as a "despicable lie."
- 28. U.S. Socialist Labor party nominated John W. Aiken of Massachusetts for president and Aaron M. Orange of New York for vice-president. ¶ C. J. Hambro, president of the Norwegian parliament, said there was "irrefutable proof that Germany prepared detailed plans for the invasion of Norway months before it actually occurred."
- 29. U.S. supreme court, by a decision of 8 to 1, sustained the authority of the department of labour, under the Walsh-Healey law, to fix minimum wages for workers on gov't contracts.
- 30. Samuel Harden Church, on behalf of a group of Pittsburgh capitalists, offered a reward of \$1,000,000 to anyone who would capture Adolf Hitler during the month of May and deliver him to the League of Nations for trial. \$\mathbb{G}\$ Great Britain ordered all British merchant shipping to keep out of the Mediterranean because of "pronouncements by Italians in responsible positions and the attitude of the Italian press." \$\mathbb{G}\$ Capture of Dombas and Stören announced by Germans; Chancellor Hitler, in an order of the day, announced to the army, "You have fulfilled the tremendous task which I... was forced to set for you."

MAY, 1940

- 1. All belligerents had assured the Vatican that they would not bomb Rome, according to a dispatch from Rome.
- 2. Prime Minister Chamberlain told the British house of commons that all British forces had withdrawn from Norway south of Trondhjem; he claimed destruction of the greater part of the German navy and announced heavier concentration of British warships in the Mediterranean.
- 3. Official soviet news agency announced that both Russia and Germany were interested in preserving the neutrality of Sweden. ¶ Norwegian commander in Trondhjem sector asked Germans for armistice after revealing Allied evacuation of Namsos on night of May 2.
- 4. Mexican reply to Sec'y of State Hull's proposal for arbitration of dispute over expropriation of U.S.-owned oil lands asserted that the issue was domestic and in process of settlement.
- 6. Pres. Roosevelt vetoed bill extending crop insurance to cotton. ¶ U.S. supreme court, reversing decision of lower courts, found 12 oil companies guilty of violating

the antitrust laws by regulating prices and production.

7. American Pacific fleet ordered to remain in Hawaiian waters indefinitely. ¶ Prime Minister Chamberlain announced that Winston Churchill had been put in charge of operations of the British forces.

8. Chamberlain was sustained by a test vote of 281 to 200 in the house of commons.

10. German forces during the night invaded Belgium, the Netherlands and Luxembourg without warning; the Netherlands and Belgium immediately declared war on Germany and called on the French and British for help. If British landed troops in Iceland. If Chamberlain resigned as British prime minister and Winston Churchill was commissioned as his successor. If Pres. Roosevelt, denouncing the invasion of the Netherlands and Belgium, said: "I believe that by overwhelming majorities . . . you and I . . . will act together to protect, to defend by every means . . . our science, our culture, our American freedom and our civilization."

11. Fort Eben Emael, strongest link in Belgian defenses around Liége, fell to Germans in surprise attack. ¶ Pres. Roosevelt ordered the application to Belgium, the Netherlands and Luxembourg of all provisions of the neutrality law. ¶ Allied troops landed on Dutch islands in the West Indies.

12. German troops advanced beyond Liége, after crossing the Albert canal, and occupied most of northern Netherlands.

13. Moerdijk bridge south of Rotterdam seized by Germans, who thus cut the Netherlands in two; Queen Wilhelmina and her family fled to England. ¶ French city of Sedan captured by nazis after rapid thrust through Ardennes. ¶ Prime Minister Churchill received a unanimous vote of confidence from the British parliament.

14. Dutch army surrendered to the Germans, except in Zeeland; Gen. Winkelman, commander in chief, appealed

to all citizens to maintain order. ¶ Rear Adm. Richard E. Byrd arrived in New York city from the antarctic and reported that his expedition had charted 900 mi. of formerly unknown coast.

15. The Allies claimed they had successfully met a German attack along a 60-mi. front from Namur to the Sedan "bulge" in France. ¶ Foreign Minister van Kleffens of the Netherlands reported that 100,000 men, or one-fourth of the nation's army, had been killed in battle.

16. Gov't of Paris transferred to military authority Pres. Roosevelt asked congress for an appropriation of \$1,182,000,000 for national defense and announced that the army and navy should be equipped with 50,000 planes

17. Fall of Brussels, Namur and Louvain announced in Berlin; German troops widened gap in French detenses around Sedan and at other points farther north along border; Gen. Gamelin, commander of the French armies ordered the various units to fight to the death rather than retreat. ¶ Pres. Roosevelt ordered the recommissioning of 35 more destroyers laid up since World War I

18. Antwerp captured by German troops nazis in northern France drove westward toward English channel

19. Gen. Maxime Wevgand was appointed commander in chief of the Allied armies to succeed Gen. Gamelin.
¶ German gov't, in an order dated May 18, proclaimed re-incorporation of Eupen, Malmedy and Moresnet.

20. U.S. supreme court, in a unanimous decision, declared unconstitutional the Connecticut law which prohibited soliciting funds for religious purposes without a permit; the court, by an 8 to 1 decision, sustained the constitutionality of the bituminous coal act.

21. The administration asked U.S. congress to authorize creation of a naval air force of 10,000 planes with 15,000 pilots. § The Germans forced their way to Abbeville at the mouth of the Somme river on the English channel after occupying Amiens and Arras. § Pres. Roosevelt

Germany's invasion of the Low Countries began without warning on May 10, 1940. Civilians are shown streaming past British troops on a Belgian road



vetoed a river and harbour bill appropriating \$109,985,450, on the ground that nonmilitary expenses should give way to preparation for national defense.

- 23. The Germans advanced to Boulogne on the English channel and strengthened ring around the trapped Allied armies in Flanders. ¶ Sir Oswald Mosley, leader of British tascists, interned in London.
- 24. Nazi troops reached Calais and fought to take the city.
- 26. Gen. Sir Edmund Ironside was made commander in chief of the home forces and was succeeded as British chief of staff by Gen. Sir John Dill. ¶ Pres. Roosevelt, in a radio address, said that the U.S. army and navy were stronger than at any time after World War I.
- 27. Jay Pierrepont Mossat was appointed U.S. minister to Ganada. ¶ League of Red Cross Societies in Geneval reported that 5,000,000 refugees from Belgium, the Netherlands, Luxembourg and northern France were in slight before the Genman armies.
- 28. King Leopold of Belgium surrendered his army to the Germans unconditionally over the protests of his cabinet and of the French command; Belgian Premier Pierlot declared the action "unconstitutional." ¶ General assembly of the U.S. Presbyterian Church adopted a resolution asking the president to recall Myron C Taylor as emissary to the Vatican. ¶ Allies captured Narvik and two adjoining towns in Norway. ¶ Council of National Defense established by Pres. Roosevelt to include seven civilians; Edward R. Stettinius, Jr., named to supervise supply of raw materials and William S. Knudsen to coordinate industry.
- 29. Lille fell before German advance; Allies, fighting to escape from Flanders pocket, flooded Yser valley region and continued evacuation of troops from Dunkirk. \P Sir kingsley Wood, new British chancellor of the exchequer, announced that a 100% tax would be levied on all profits above a fixed rate.
- 30. Arthur Seyss-Inquart took office as civil administrator of the Netherlands. ¶ Wilbur Shaw of Indianapolis won the 500-mi. automobile race on the Indianapolis speedway for the third time.
- 31. Pres. Roosevelt told congress that the extensive use of tanks and planes in war made it imperative that at least \$1,000,000,000 more should be spent for U.S. national desense. I London announced that three-fourths of the British expeditionary force in Flanders had been safely evacuated from Dunkirk.

JUNE, 1940

- 1. The 35,000-ton U.S. battleship "Washington" was launched at the Philadelphia navy yard. ¶ German planes taided southern France for the first time, dropping bombs in the Rhone valley and on the port of Marseilles. ¶ Ion Gigurtu, a pro-German, was named foreign minister of Rumania.
- 2. National convention of the U.S. Communist party at New York city nominated Farl Browder of Kansas for president and James W. Ford of New York, a Negro, for vice-president.
- 3. German planes dropped more than 1,000 bombs on Paris, killing 254 persons and injuring 652; French planes in retaliation bombed German cities.
- 4. German troops took possession of Dunkirk after it had been evacuated by the Allies; nazis occupied last of Belgian territory. ¶ Prime Minister Churchill, in describing the evacuation of Dunkirk to the house of commons, said that even if the British had to stand alone against the German military machine, the empire would fight to



Fatigued British soldiers arriving home early in June 1940 after the heroic evacuation of about 330,000 French and British troops from Dunkirk

the bitter end until in "God's good time" the new world came to the rescue of the old. ¶ Sir Stafford Cripps, a left wing labourite, was accepted by the U.S.S.R. as British ambassador to Moscow. ¶ Charles Edison, U.S. sec'y of the navy, resigned to run for governor of New Jersey on the Democratic ticket.

- 5. The Germans began an attack upon the French on a battle line extending 120 mi. cast from Abbeville on the English channel with a reported force of 1,000,000 men, 1,000 bombers, 2,250 tanks and 15,000 motor vehicles. ¶ Premier Reynaud of France remade his cabinet, dropping former Premier Daladier as minister of foreign affairs and assuming that post himself. ¶ International Ladies' Garment Workers union resumed its affiliation with the American Federation of Labor.
- 6. U.S. state department ordered that, beginning July 1, all visitors to the U.S.A. from Canada, Mexico, Cuba and several other American countries should have passports. ¶ Naval appropriation bill calling for \$1,492,000,000 was sent to the president for his approval. ¶ French army communiqué claimed wholesale destruction of German

tanks but conceded axis advances below Abbeville and Laon.

- 7. Italian merchant ships at sea were ordered to take refuge in the nearest neutral port.
- 8. French army's left wing retreated along line extending from Neufchâtel to vicinity of Soissons.
- 9. The French battle line was extended to the Swiss frontier, with approximately 2,000,000 Germans engaged; nazis reached outskirts of Rouen.
- 10. Premier Mussolini declared war against France and England; he exempted Turkey, Switzerland, Yugoslavia, Greece and Egypt from military designs. ¶ King Haakon of Norway ordered that resistance to the Germans should end following the withdrawal of French and British troops from Narvik; he and his gov't went to England. ¶ Pres. Roosevelt, referring in an address at the University of Virginia to the Italian declaration of war, said "the hand that held the dagger has plunged it into the back of its neighbour." ¶ French gov't moved from Paris to Tours and other towns in the Loire valley. ¶ Sinking of the British aircraft carrier "Glorious" during evacuation of Narvik announced in London.
- 11. Pres. Roosevelt, by proclamation, extended the neutrality act to relations with Italy. ¶ Princess Juliana of the Netherlands and her two young daughters arrived in Halifax, N.S. ¶ Italian planes bombed Malta and Aden; British bombed Italian bases in Libya and Eritrea. ¶ Turkey summoned 200,000 additional men to arms, making a total of 550,000 ready for war.
- 12. Chungking, provincial capital of China, suffered the severest bombing after May 1939; 127 planes dropped explosives on the city and destroyed the homes of 150,000 persons. ¶ British planes bombed Turin and Genoa. ¶ Egypt, pledging loyalty to the Allies, broke off diplomatic relations with Italy.
- 13. Paris was declared an open city in order to prevent its destruction by the Germans. ¶ Premier Reynaud, in a message to Pres. Roosevelt, asked for "clouds of planes from across the Atlantic" to ward off French defeat. ¶ The 35,000-ton U.S. battleship "North Carolina" was launched at the Brooklyn navy yard. ¶ Turkey signed a trade agreement with Germany.
- 14. Paris was occupied by German troops; nazis opened attack on northern flank of Maginot line; Le Havre fell. ¶ Spanish troops occupied international zone of Tangier. ¶ French gov't moved from Tours to Bordeaux.
- 15. The Germans outflanked the Maginot line after taking Verdun as the French moved their troops from the fortifications. ¶ Col. Charles A. Lindbergh warned against "minority efforts" to involve the U.S.A. in war, insisted that the U.S.A. was unprepared and urged that national defenses be strengthened. ¶ Russian troops moved into Lithuania.
- 16. Premier Reynaud resigned; Marshal Henri Philippe Pétain succeeded him. ¶ Sen. Key Pittman (Dem., Nev.) criticized Col. Lindbergh for his speech of June 15 and charged him with trying to destroy confidence in the national administration. ¶ While the French were considering surrender, Prime Minister Churchill proposed to them a Franco-British federation; the plan was rejected by Pétain's gov't.
- 17. France sued for "an honourable peace." ¶ Russia followed its occupation of Lithuania by sending armed forces into Latvia and Estonia.
- 18. Hitler and Mussolini met in Munich to draft the terms on which they were willing to end the war with

- France. ¶ Prime Minister Churchill told the house of commons that Great Britain had not released France from its agreement not to sign a separate peace. ¶ German planes, in the first concerted attack on Britain, raided the eastern coast of England. ¶ Germans took Cherbourg on the French coast; French admitted capture of Orleans.
- 19. The earl of Athlone, new governor general of Canada, arrived at Halifax, N.S.
- 20. Harry H. Woodring, U.S. see'y of war, resigned; Henry L. Stimson of New York nominated as sec'y of war and Frank Knox of Illinois as sec'y of the navy. ¶ France asked Italy for an armistice.
- 21. King Carol of Rumania organized a single totalitarian "party of the nation" to supersede all other political parties.
- 22. Germany and France signed an armistice in the forest of Compiègne by which France agreed to surrender all its sea forces and demobilize its land and air forces; terms also provided for nazi occupation of approximately half of France. ¶ U.S. congress passed an act raising the limit of the national debt from \$45,000,000,000 to \$49,000,000,000 and approved a national defense tax bill to yield \$994,300,000 a year.
- 23. Great Britain withdrew recognition of the French gov't which accepted the terms of the armistice with Germany. ¶ A French national committee led by Gen. Charles de Gaulle was formed in London to carry on the war with the aid of Free French forces.
- 24. The French signed an armistice with Italy, and an order to end hostilities was issued. ¶ Pres. Roosevelt, after receiving a report from the attorney-general that the sale of warships to belligerents was forbidden by law, countermanded an order to turn over to the builders 20 torpedo boats for sale to England. ¶ Yugoslavia entered into diplomatic relations with U.S.S.R.
- 25. Fighting between France and Germany and Italy ceased at 12:35 A.M., French time. ¶ Pres. Roosevelt signed new tax bill which reduced exemption from income taxes for married persons from \$2,500 to \$2,000 a year and for single persons from \$1,000 to \$800. ¶ The Germans occupied the whole Atlantic coast of France.
- 26. U.S. Export-Import bank granted a credit of \$20,000,000 to Argentina for the purchase of construction materials in the U.S.A.
- 27. Rumania yielded to Russia's demand for Bessarabia and northern Bukovina; Russian troops moved into the ceded territory. ¶ Pres Roosevelt declared the existence of a national emergency to enable the gov't to control American and foreign shipping in U.S. territorial waters and around the Panama canal.
- 28. Wendell Lewis Willkie of New York nominated by Republicans for president and Charles Linza McNary of Oregon for vice-president. ¶ Great Britain recognized the French national committee in London as the leader of all Free Frenchmen, and as an ally.
- 29. When Russian troops moved from Bessarabia into Moldavia, a part of Rumania not ceded to Russia, King Carol ordered the mobilization of all Rumanian troops. The Germans took possession of Bordeaux; the French gov't moved temporarily to Clermont-Ferrand on June 30. Thachiro Arita, Japanese foreign minister, announced that Japan favoured uniting all east Asia and the South seas under a single dominating influence.

JULY, 1940

1. Channel islands of Guernsey and Jersey occupied by Germans after they had been evacuated by the British.

¶ Rumanian council of ministers renounced the Franco-



Widely published photograph which came to epitomize French sentiment at the fall of France in 1940. These French citizens are shown weeping openly as they watched Germans march through the streets of Marseilles

British guarantee of April 13, 1939, as of no further value. ¶ Pres. Roosevelt signed a bill forbidding sale or transfer of any vessels, weapons or munitions of war to a foreign power without previous certification that they were not essential to national defense.

2. German casualties of 27,074 killed in campaigns starting May 10 announced by high command. ¶ British prison ship "Arandora Star," carrying 1,640 interned Germans and Italians to Ganada, sunk by a German submarine off coast of Ireland; more than 1,000 of the internees drowned. ¶ U.S. treasury department reported that deficit for fiscal year 1940 was \$3,612,000,000. ¶ French gov't moved its headquarters to Vichy.

3. Pres. Ortiz of Argentina turned over the duties of his office to Vice-Pres. Castillo for an indefinite period. ¶ British seized ships of the French navy in English ports and forbade French ships at Alexandria to leave port; when French ships off Oran, Algeria, rejected the terms offered, the British opened fire and sank or disabled nearly all the fleet.

4. Library at Hyde Park, N.Y., built to hold state papers and other documents of Pres. Roosevelt, was turned over to the national archivist. ¶ King Carol of Rumania appointed a pro-German and anti-Jewish cabinet with Ion Gigurtu as premier.

5. French foreign minister announced at Vichy that diplomatic relations with Great Britain had been ended.
¶ German armistice commission, following Britain's attack on French naval units at Oran, released France's sea and air forces from prohibition against engaging in hostilities; French planes bombed Gibraltar.
¶ Pierre Laval named by Pétain gov't to draw up new French constitution.
¶ Germany, replying to Sec'y of State Hull's note of June

18 on the Monroe Doctrine, said that the U.S. note was unjustified and that if the U.S.A. objected to European interference in American affairs it should refrain from interfering in the affairs of Europe.

6. Hitler, absent from Berlin after May 10, returned to the city and was welcomed with great enthusiasm as he drove over streets covered with flowers.

9. Duke of Windsor appointed governor of the Bahamas. ¶ Commanders of the French fleet in Alexandria harbour agreed, on the demand of the British, to immobilize their warships. ¶ First large naval engagement in the Mediterranean between British and Italians fought east of Malta; both sides claimed victory. ¶ Joseph W. Martin, Jr., named chairman of the Republican national committee with John D. M. Hamilton, retfring chairman, as his assistant. ¶ Henry L. Stimson confirmed by senate, 56 to 28, as U.S. sec'y of war.

10. U.S. senate confirmed nomination of Frank Knox as sec'y of the navy, 66 to 16. ¶ Additional appropriation of \$4,848,171,957 for national defense asked by Pres. Roosevelt; he declared that no American soldiers would be sent abroad to take part in any European war. ¶ French national assembly at Vichy gave Premier Pétain authority to promulgate a new constitution fashioned on the fascist model to be submitted to popular vote for ratification

11. Sec'y of State Hull warned Germany against at tempts to intimidate delegates to the Pan-American con ference in Havana. ¶ Marshal Pétain assumed full legis lative and executive powers in France.

12. British recognized Haile Selassie as emperor of Ethiopia and promised to help him in drive against Italians.

14. Fulgencio Batista elected president of Cuba, defeating Ramon Grau San Martin.

15. Italian planes bombed Haifa in first air attack on Palestine.

- 16. Spain broke off diplomatic relations with Chile.
- 17. Francisco Franco served notice on Great Britain that Spain expected to recover control of Gibraltar.
- 18. Pres. Roosevelt was nominated by Democratic national convention on first ballot, for a third term, receiving 946 votes out of 1,0951/2 cast.
- 19. Henry A. Wallace of Iowa, see'y of agriculture, nominated for vice-president by the Democrats.
- 20. Pres. Roosevelt signed bill appropriating \$4,000,000,000 for a two-ocean navy. \$\mathbb{T}\$ Hatch bill, prohibiting state employees paid in part by federal funds from engaging in political activity, signed by Pres. Roosevelt.

21. Parliaments of Lithuania, Latvia and Estonia, elected July 14, declared their countries part of the soviet union.

- 22. Sec'y of State Hull proposed to the Pan-American conference a collective trusteeship by the 21 American republics over European possessions in the new world, should the occasion arise. § Prince Fumimaro Konoye, new Japanese premier, formed a cabinet which he said would enhance the spirit in which the empire was founded. § Canadian department of munitions decided to build 12 munition factories at a cost of \$19,000,000.
- 23. French gov't ordered trial of former Premier Daladier and 22 other former officials on the charge of responsibility for military catastrophe. § Budget calling for £3,467,000,000 was presented to the British parliament with provision for an income tax beginning at $42\frac{1}{2}\%$ and rising to 90^{o_0} on large incomes. § Undersec'y Welles of the state department announced that the U.S.A. would continue to recognize the ministers of Lithuania, Latvia and Estonia as envoys of sovereign gov'ts under duress.
- 25. Pres. Roosevelt placed an embargo on the export of scrap metal, petroleum and petroleum products without a special licence.
- 27. U.S. state department ordered opening of consulate at Georgetown, British Guiana, which had been closed for 20 years.
- 30. Pan-American conference at Havana adjourned after approving plans for dealing with European possessions in the new world. ¶ Great Britain extended its naval blockade to include all of continental Europe.
- 31. Embargo on export of U.S. aviation gasoline outside the western hemisphere, except to supply American air lines, proclaimed by Pres. Roosevelt. ¶ Japanese foreign office spokesman said that British protest against the arrest of British citizens was unreasonable and that Japan would continue to arrest everyone suspected of spying or working against the interests of the country.

AUGUST, 1940

- 1. Edward J. Flynn of New York elected chairman of the Democratic national committee. ¶ Premier Molotov, addressing the supreme soviet in Moscow, said that Europe's "imperialist war" might soon involve America; he reaffirmed Russian friendship with Germany.
- 2. French military court found Gen. Charles de Gaulle, leader of Free French in England, guilty of treason and sentenced him to death. ¶ Prominent Japanese business men in London and other parts of the British empire were arrested.
- 6. The Italians attacked British Somaliland at three points and began a movement to invade Egypt from Libya. ¶ Annual trade agreement between Russia and the U.S.A. renewed.
- 8. Representation on the governor general's council and ultimate dominion status was offered to India by the

- British. § U.S. sec'y of the treasury announced that money in the U.S. belonging to the gov't and citizens of countries invaded by Germany—about \$2,000,000,000—would be held until the end of the war for possible use in paying claims of the U.S. and its citizens.
- 9. Great Britain recalled all troops from Shanghai and northern China.
- 10. The U.S.A. announced it would re-open its cousulates in Dakar, French West Africa and on the French islands of St. Pierre and Miquelon, as "listening posts."
- 11. What the British regarded as the start of massed attacks took place when the Germans increased the intensity of the bombing of the southeastern coast of England
- 12. The soviet gov't demanded that the U.S.A. remove all its diplomatic and consular agents from Lithuania, Latvia and Estonia.
- 14. British dropped bombs on Milan, Turin, Alessandria, Tortona and Augusta, Italy. ¶ British admiralty announced that the 16,923-ton armed merchant cruiser "Transylvania" had been sunk by a German submarine.
- 15. Intensity of German raids on England and Scotland increased when more than 1,000 planes dropped bombs on the country, attacking the London airport for the first time. ¶ Minseito party, largest political organization in Japan, was dissolved in accordance with the governmental plan to recognize only a single party.
 - 16. Metropolitan London bombed heavily.
- 17. Germany proclaimed a complete blockade of the British Isles. ¶ Rumania agreed to cede to Bulgaria all of southern Dobruja. ¶ Wendell L. Willkie accepted the Republican presidential nomination in a speech at Elwood, Ind., in which he challenged Pres. Roosevelt to a joint debate on domestic issues.
- 19. Rumania indicated its willingness to cede to Hungary about one-fifth of the territory in Transylvania demanded by the latter. ¶ British withdrew their forces from Somaliland and abandoned attempt to defend it against the Italians. ¶ Claude R. Wickard of Indiana, undersec'y of agriculture, nominated sec'y of agriculture by Pres. Roosevelt.
- 20. Prime Minister Churchill told parliament that Great Britain would place defense facilities of its transatlantic possessions at the disposal of the U.S.A. ¶ London verified report that German artillery on the French coast had been bombarding the southeastern coast of England. ¶ Pres. Roosevelt declined, because of the press of official duties, Mr. Willkie's challenge to debate the issues of the campaign. ¶ Italy proclaimed a blockade of all British possessions in the Mediterranean, along the Red sea, the Gulf of Aden and the coast of colonies in South Africa.
- 21. Congress amended U.S. neutrality law to permit entry of American ships into the war zone to evacuate children.
- 22. Pres. Roosevelt and Prime Minister Mackenzie King of Canada appointed joint board of defense consisting of five members from each country. ¶ Japan recalled 40 diplomats, including the ambassador to the U.S.A. ¶ Egyptian war minister announced that Egyptian forces had joined British troops to repel any Italian invasion. ¶ Relations between Greece and Italy reached new crisis; British announced that the royal navy and air force would go to the aid of Greece. ¶ Working committee of the All-India Nationalist congress voted to reject British offer of ultimate self-rule for India.
- 24. Argentine congress, by vote of 170 to 1, refused to accept resignation of Pres. Ortiz. ¶ Harry L. Hopkins resigned as U.S. sec'y of commerce.

- 26. Berlin experienced first sustained air raid by British.
- 27. Pres. Roosevelt signed bill passed Aug. 23, authorizing him to call out the U.S. national guard and the organized reserves for a year's service.
- 29. Gen. de Gaulle announced that the greater part of French Equatorial Africa had decided to join the British in fighting Germany and Italy.
- 30. Yielding to pressure from Germany and Italy at the Vienna conference, Rumania agreed to cede approximately one-half of Transylvania to Hungary on the promise that all new boundaries would be defended by the axis.
- 31. Mexican court fixed value of expropriated oil lands at \$35,525,000, which, after deduction of \$23,400,000 for claims of various kinds, left \$12,125,000 for the owners. The count of Paris, succeeding his father as pretender to the French throne, promised to fight for the restoration of his country. Trank C. Walker of Pennsylvania nominated postmaster general to succeed James A. Farley.

SEPTEMBER, 1940

- 1. Pres. Roosevelt issued first order calling out 60,000 members of the national guard from 26 states for a year's service. ¶ Dr. Carlos Arroyo del Rio inaugurated president of Ecuador at Quito.
- 2. Pres. Roosevelt dedicated the Chickamauga dam near Chattanooga, Tenn., and the Great Smoky Mountain national park on the border of Tennessee and North Carolina.
- 3. Pres. Roosevelt informed congress that he had made an agreement with Great Britain under which the U.S.A. obtained the right to lease sites and build air and naval bases in the Bahamas, Jamaica, St. Lucia, Trinidad, Antigua and British Guiana in return for 50 over-age destroyers and that the British had given the U.S.A. the right to build similar bases in Bermuda and Newfoundland. § A pitched battle between Hungarians and Rumanians protesting against the transfer of one-half of Transylvania to Hungary resulted in the death of 180 soldiers and civilians.
- 4. King Carol of Rumania appointed Gen. Ion Antonescu as premier, dissolved parliament by decree, suspended the constitution and gave supreme power to Antonescu.
- 6. King Carol, yielding to pressure from the new premier and the pronazi Iron Guard, abdicated in favour of his 18-year-old son Prince Michael (Mihai).
- 7. Former premiers Daladier and Reynaud and Gen. Gamelin were arrested preparatory to trial on the charge of responsibility for the defeat of France.
- 9. Pres. Roosevelt signed supplementary defense appropriation bill for \$5,246,000,000. ¶ Tel Aviv, Palestine, was bombed by Italian planes; 112 persons killed.
- 11. Prime Minister Churchill warned the British people to be prepared for an attempted German invasion within a week. ¶ Damage to Buckingham palace by German delayed aerial bomb on Sept. 10 announced in London.
- 12. Mexican congress formally declared that Gen. Manuel Avila Camacho was elected president July 7 with 2,476,641 votes to 151,101 for Gen. Almazán. ¶ Italian forces crossed Libyan frontier to invade Egypt.
- 14. U.S. congress passed the selective service bill providing for the registration of all men between the ages of 21 and 35, with a proviso that not more than 900,000 were to be drafted in any one year; Pres. Roosevelt asked congress for \$1,600,000,000 to pay the cost of the first year's training of those drafted.
- 15. Ex-Premier Blum of France was arrested to be tried on charges growing out of the defeat by Germany. ¶ All-

India congress working committee approved a resolution withdrawing a provisional offer to co-operate with Great Britain.

- 16. Pres. Roosevelt signed the selective service bill and called on all men within the prescribed age limits to register Oct. 16. ¶ Sam Rayburn (Dem. Tex.) elected speaker of the house of representatives to succeed the late Speaker Bankhead. ¶ Italians occupied Sidi Barrani on Egyptian coast after sharp engagement with British.
- 17. Republic of San Marino, northern Italy, repealed its declaration of war against Germany, made in 1915, and declared war upon Great Britain.
- 19. Gen. Manuel Avila Camacho, president-elect of Mexico, announced that no communists would be permitted to collaborate with his gov't.
- 22. London announced that the "City of Benares," a refugee ship, was torpedoed by a submarine Sept. 17. ¶ The governor general of Indo-China agreed to permit the Japanese to establish three air bases in Tongking, to garrison them with not more than 6,000 troops and to maintain a small force at Hai-phong; despite this agreement the Japanese crossed the northern border and attacked the French defenders.
- 23. Lawrence W. Robert, Jr., of Atlanta, Ga., sec'y of the Democratic national committee under criticism in congress because his architectural firm had received gov't contracts yielding \$900,000 in fees, resigned his secretary-ship. ¶ Germany warned Egypt and Greece that they should renounce their ties with Great Britain; Egypt was placed under martial law.
- 24. Defense Communications board established by Pres. Roosevelt to prepare plans for the co-ordination of communication systems in national defense.
- 25. British abandoned attempt begun Sept. 23 to land Free French troops under Gen. de Gaulle at Dakar, Senegal, after the French forces in the colony, loyal to the Vichy gov't, resisted the attack. ¶ The German high commissioner for Norway set up a gov't with Vidkun Quisling, Norwegian nazi, as its head. ¶ The Democrats in the house of representatives elected John W. McCormack of Massachusetts to succeed Sam Rayburn, new speaker, as floor leader.
- 26. Pres. Roosevelt placed an embargo on the shipment of steel and iron scrap, effective Oct. 16, to any point outside the western hemisphere with the exception of Great Britain. ¶ Milo J. Warner of Toledo, O., was elected commander of the American Legion at its Boston convention.
- 27. Representatives of Germany, Italy and Japan signed a treaty in Berlin under which Japan recognized German and Italian leadership in the creation of a "new order in Europe" and Germany and Italy recognized the leadership of Japan in the creation of a new order in "the greater East Asia." ¶ U.S. senate ratified the Havana treaty under which the 21 American republics agreed to prevent transfer of any territory in the western hemisphere from one non-American power to another.
- 30. Prime Minister Churchill, in an address broadcast to Czechoslovakia, said that freeing that country was one of the British war aims.

OCTOBER, 1940

1. Dr. Arnulfo Arias was inaugurated as president of Panamá. ¶ Congress passed excess profits tax bill estimated to yield \$500,000,000 the first year and \$1,000,000,000 yearly thereafter.

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- 2. U.S. navy department began organization of a patrol force of 125 ships in the Atlantic supported by an undisclosed number of planes.
- 3. Great Britain levied a sales tax of 24% on luxuries and 12% on other items, exclusive of food, fuel, gas, electricity and water.

4. Hitler and Mussolini, accompanied by their foreign secretaries, conferred in Brenner pass.

- 5. Premier Konove of Japan said that if the U.S. recognized Japanese leadership in East Asia, Japan would recognize a similar leadership of the U.S.A. in the western hemisphere. § Sec'y of the Navy Knox ordered into active service all organized naval and marine reserves, to the number of 27,591.
- 8. German troops in large numbers moved into Rumania "to instruct the Rumanian army in nazi methods of warfare" and to guard the oil fields against sabotage.
 ¶ Cincinnati defeated Detroit for the world's baseball championship, four games to three.
 ¶ Prime Minister Churchill announced that the Burma road which was closed July 17 would be reopened Oct. 17 for the transit of military and other supplies to China.
- 9. General Charles de Gaulle landed at Duala, French Cameroons, to take charge of the Free French forces there. § A German bomb dropped through the roof of St. Paul's cathedral in London, wrecking the high altar.
- 10. Pres. Roosevelt ordered the impounding of \$100,000,000 of Rumanian funds in the U.S., bringing the total of impounded funds belonging to nations invaded by Germany to about \$3,000,000,000.
- 11. Fulgencio Batista was inaugurated as president of Cuba. ¶ Russia and Finland agreed to demilitarize the Aland islands at the entrance to the Gulf of Bothnia.
- 12. Pres. Roosevelt said that no combination of dictator nations in Europe or Asia would stop U.S. aid to the British.
- 15. Germany took control of the production and distribution of Rumanian oil.
- 16. Approximately 16,000,000 U.S. men between the ages of 21 and 35 registered for the draft under the selective service law.
- 18. The British air ministry announced that German troops had embarked on ships for the invasion of England on Sept. 16, but that the attempted invasion was prevented by the activity of the royal air force. ¶ Pres. Roosevelt signed a bill requiring registration of all foreign controlled organizations and all those engaged in any kind of activity aimed at the overthrow of the U.S. gov't.
- 19. Yugoslavia signed a trade agreement with Germany. ¶ Former Premiers Blum and Reynaud and former Minister of the Interior Mandel were charged by the French War Guilt court with betrayal of duties, embezzlement and speculation in the national currency. ¶ Italian planes bombed American-owned oil refineries on the island of Bahrein in the Persian Gulf.
- 20. Italian planes dropped bombs on Cairo for the first time.
- 21. Prime Minister Churchill, in an address broadcast to France, appealed to the French to resist all efforts to persuade them to join the Germans in fighting Great Britain. ¶ A spokesman for the Moslems of India denounced the Italian attack on the island of Bahrein as "an insult to Islam and the east." ¶ President Cárdenas, as "an act of continental solidarity," cancelled the oil exploration grant made earlier in month to Japanese interests in Mexico.

- 22. Conference between Hitler and French Vice-Premier Laval announced in Berlin. ¶ London announced that British citizens had been advised to leave Japan and Japanese-occupied territory. ¶ Removal of many thousands of children from Berlin, Hamburg and other German cities to places of safety in the country announced in German capital.
- 23. Chancellor Hitler of Germany and General Franco of Spain conferred at the French-Spanish border. ¶ Vichy gov't declared that under no circumstances would France make war on Great Britain or permit the axis powers to use the French navy. ¶ Japan denounced 1911 agreement with the United States, Russia and Great Britain for protection of fur-bearing seals in the North Pacific ocean.
- 25. John L. Lewis, head of the C.I.O., urged all members of the organization to vote for Willkie for president and said that if they failed to elect Willkie he would accept this decision as an indication of a lack of confidence in his leadership and would retire. ¶ Col. Benjamin O Davis was promoted by the president to the rank of brigadier general, the first Negro to hold such a commission in the U.S. army.
- 26. Vichy announced that Hitler and Pétain had agreed in principle on Franco-German co-operation "to reconstruct peace in Europe." ¶ Pres. Roosevelt notified the French gov't that close military co-operation with Germany would bring about the occupation of Martinique and French Guiana by the American republics.
- 27. The world's fair in New York city closed. ¶ Gen. Juan. A. Almazán, who was defeated in the Mexican presidential election of July 7, announced in Baltimore that he would take office on Dec. 1 with the backing of the Mexican army.
- 28. Italy invaded Greece at 6 A.M., three hours after issuing an ultimatum which accused Athens of unneutral conduct; Premier John Metaxas rejected Rome's demands and declared war; Great Britain promised Greece all possible assistance. ¶ Hitler and Mussolini met in Florence for reported consultation about peace terms with France.
- 29. U.S. draft lottery held in Washington; first number —158—was drawn by See'y of War Stimson. ¶ President Cárdenas announced that American naval and air bases would be established in Mexico under Mexican control.
- 30. Great Britain landed marines on Greek islands and mined Greek harbours.
- 31. Vice-Premier Laval of France was quoted as saying in an interview that the victories of the totalitarian powers had convinced him that democracy was lost throughout the world. ¶ Japan announced withdrawal of its troops from Kwangsi province in China, bordering on French Indo-China.

NOVEMBER, 1940

- 1. Naples bombed for first time by British; Italian planes raided Salonika.
- 4. Spain took possession of the international zone in Tangier which was occupied by Spanish troops on June 1.
- 5. Pres. Roosevelt was re-elected by 449 electoral votes to 82 for Wendell L. Willkie; the Democrats retaining control of congress, losing 4 seats in the senate and gaining 9 in the house of representatives. ¶ Prime Minister Churchill announced that the British had established an air and naval base on the Greek island of Crete.
- 6. Jawaharlal Nehru, selected to lead a campaign of civil disobedience in India, was sentenced to imprisonment for four years by an Anglo-Indian court.
- 7. Pres. Roosevelt returned to Washington from Hyde Park, N.Y., and was welcomed by enthusiastic crowds.

¶ The 2,800-ft. span of the supension bridge between Tacoma, Wash., and the Olympic peninsula was wrecked by a wind storm and fell into Puget sound. ¶ Prime Minister de Valera of Eire announced that the British would not be allowed to use nation's ports.

8. Pres. Roosevelt announced that about one-half of the planes and other war materials produced in the U.S. would be allotted to Great Britain. ¶ Hitler, in Munich to celebrate the anniversary of the beer hall putsch, said he rejected any compromise and would fight until there was a decision; about an hour after Hitler had finished his speech British planes, aiming at railroad lines in the city, dropped bombs on the hall in which he had appeared.

11. Wendell L. Willkie, in a radio address, called on all those who voted for him Nov. 5 to unite with all others in national defense, but to preserve an effective "loyal opposition" to the party in power for the good of the nation. ¶ Libreville, capital of Gabon, French Equatorial Africa, surrendered to the Free French forces of Gen. de Gaulle.

13. Prime Minister Churchill announced that the British naval air force had disabled 3 Italian battleships, 2 cruisers and 2 fleet auxiliaries in the harbour of Taranto on the night of Nov. 11–12.

14. German planes, in retaliation for the British bombing of Munich, dropped bombs on Coventry in the English midlands, killing about 200 persons, injuring 800 and wrecking most of the buildings in the city. ¶ The Vichy gov't protested to Germany against the expulsion of 800,000 French-speaking residents of Lorraine. ¶ Following Berlin conference between Hitler and Molotov, it was announced in Berlin that agreement had been reached on all questions of importance to Germany and Russia.

15. Pres. Roosevelt proclaimed the neutrality of the U.S. in the Italo-Greek war.

Government clothing issue being distributed to men entering military training at Fort Devens, Mass., shortly after the passage of the U.S. Selective Service act of 1940

16. The Communist party of the U.S. voted to end its affiliation with the Communist international.

17. King Boris of Bulgaria went to Berlin to confer with Hitler.

20. Hungary signed a treaty in Vienna under which it joined the alliance of Germany, Italy and Japan.

21. 32 states observed Thanksgiving day as recommended by the president; other 16 chose Nov. 28.

22. Greek troops occupied Koritza (Kortcha), main Italian military base in Albania. ¶ Philip Murray, vice-president of the United Mine Workers of America, was elected president of the Congress of Industrial Organizations to succeed John L. Lewis.

23. Rumanian representatives in Berlin signed a treaty joining the alliance of Germany, Italy, Japan and Hungary; Slovakia joined next day.

26. The president signed Ramspeck bill placing 200,000 temporary federal employees into the classified civil service. ¶ Strike in Vultee aircraft factory at Downey, Calif., was settled after an increase of pay had been granted.

27. Members of the nazi Iron Guard in Rumania broke into the military prison at Jihlava and killed 64 former officials of ex-King Carol, charged with the death of Corneliu Codreanu, leader of the Iron Guard, and 13 others in 1938; 20 others killed next day.

28. A riotous mob of supporters of Gen. Almazán gathered about the U.S. embassy in Mexico City on the arrival of Henry A. Wallace, to protest against the validity of the election of Gen. Avila Camacho. ¶ William Green was re-elected president of the American Federation of Labor. ¶ Kjösti Kallió, president of Finland, resigned.

30. Pres. Morinigo proclaimed a dictatorship in Paraguay. ¶ Germany announced that Lorraine had been incorporated into the reich and united with the Saar region under the name of Westmark. ¶ A treaty formally recognized



nizing the puppet gov't of China under Wang Ching-wei was signed by Japan in Nanking. § Following the Japanese recognition of Wang Ching-wei's gov't the U.S. announced that arrangements had been made to advance \$100,000,000 to the gov't of Chiang Kai-shek.

DECEMBER, 1940

- 1. Gen. Manuel Avila Camacho took the oath of office as president of Mexico. 5 Gen. Antonescu, Rumanian premier, said that Rumania would never renounce its claims to Transylvania, part of which had been annexed by Hungary.
- 2. Pres. Roosevelt signed a bill making sabotage a criminal offense in time of peace and another bill amending the Philippine constitution to change the presidential tenure from one term of six years to not more than two terms of four years.
- 3. Paul V. McNutt, federal security administrator, was named by the National Defense council as co-ordinator of all health, medical welfare, nutrition, recreation and other activities affecting U.S. national defense.
- 5. The British house of commons, by a vote of 341 to 4, rejected a proposal to seek a negotiated peace. ¶ Arrangements were completed by the U.S. to lend \$50.000,000 to Argentina to stabilize its currency. ¶ Russia informed Tokyo that its policy toward the gov't of Chiang Kai-shek in China was unchanged by Japanese recognition of Wang Ching-wei.
- 6. Porto Edda, Albania, occupied by Greeks; Marshal Pietro Badoglio, chief of the general staff of the Italian army, was relieved of his command.
- 8. Admiral Domenico Cavagnari, head of the Italian navy, resigned. ¶ Italians abandoned Argyrokastron to Greek forces.
- 9. British mechanized forces began lightning drive against Italians in Egypt. ¶ Japanese Foreign Minister Matsuoka said that the alliance with Germany and Italy was not made in contemplation of war against the U.S. and that Japan would not make war on the U.S.A. unless the latter was an aggressor.
- 11. The British recaptured Sidi Barrani, advance base of Italian forces in Egypt, taking 20,000 prisoners, including three Italian generals. ¶ Arrangements for a loan of \$60,000,000 to, Argentina by the U.S. Export-Import bank were made, in addition to a previous loan of \$50,000,000 from the stabilization fund; a loan of \$7,500,000 to Uruguay was also authorized.
- 12. Pres. Avila Camacho of Mexico directed the head of the agrarian department to take the necessary steps to give farmers title to the communal lands on which they were working.
- 13. After a stormy session of the French cabinet Premier Pétain ordered the arrest of Pierre Laval, vice-premier and foreign minister, suspected of plotting against the gov't, abolished his office as vice-premier and later appointed Pierre-Etienne Flandin as foreign minister.
- 14. Argentina and Uruguay agreed on the joint defense of the River Plata. ¶ British troops reached vicinity of Egyptian-Libyan frontier and pursued retreating Italians across the border, after recapturing Sidi Barrani.
- 15. The body of the duke of Reichstadt, son of Napoleon I, removed from Vienna, was deposited in the Invalides in Paris beside the body of his father.
- 17. Plan to lend arms to Great Britain without immediate payment announced by Pres. Roosevelt.
 - 18. Pres. Roosevelt vetoed Logan-Walter bill providing

- for judicial review of decisions by executive agencies; motion to override the veto was deteated in the house of representatives. ¶ Pierre Laval, deposed French vice premier and foreign minister, was released from airest and went to Paris after visit of Otto Abetz, German high commissioner in France, to Vichy.
- 20. Pres. Roosevelt created a new four-man defense council known as the office for production management and defense, with William S. Knudsen as its head. ¶ London announced that a British fleet had made its way through the strait of Otranto Dec. 18 and bombarded Valona, Albania.
 - 21. Risto Ryti was sworn in as president of Finland.
- 23. Viscount Halifax was appointed British ambassador to the U.S. to succeed the late Lord Lothian; Anthony Eden was named foreign secretary. ¶ Prime Minister Churchill broadcast a plea to the monarchy, the church and the people of Italy to get rid of Mussolini and resume peaceful relations with Great Britain.
- 24. Japan and Thailand (Siam) proclaimed a treaty in which each pledged to respect other's territorial integrity.
- 25. Premier Eamon de Valera of Eire appealed to the U.S. for food and weapons.
- 26. Unofficial two-day Christmas truce in aerial war between Great Britain and Germany ended by raid of lone bomber over mouth of Thames.
- 28. About 5,000,000 aliens were listed under the law requiring their registration in the U.S.
- 29. Pres. Roosevelt, in a broadcast address, said that his whole purpose was to keep the U.S. out of war while supplying to Great Britain and its allies all possible help. The Germans subjected London to one of the severest bombings of the war.
- 31. Pres. Roosevelt sent a New Year's message to King Victor Emmanuel expressing the hope that Italy might enjoy the blessing of a righteous peace in 1941.

JANUARY, 1941

- 1. Unidentified planes believed to be German raided parts of Eire; attacks were repeated during two following days, when Dublin was bombed.
- 2. Presence of German warplanes and pilots in Italy to assist in Mediterranean campaign against British admitted in Rome.
- 3. First session of the 77th United States congress convened; Sam Rayburn (Dem., Tex.) re-elected speaker of house.
- 4. Syrian high commissioner, Gen. Henri Dentz, placed under command of Gen. Weygand by Vichy gov't.
- 5. Bardia occupied by Australian shock troops after two-day assault by land, sea and air; British claimed capture of more than 35,000 Italian prisoners. ¶ William D Leahy, new U.S. ambassador to France, arrived in Vichy.
- 6. Pres. Roosevelt, in annual message to congress, declared U.S.A. should act as arsenal to supply all necessary war supplies to democracies defending themselves against aggressor nations; he said new world order should be based on freedom of speech and worship and freedom from want and fear.
- 7. Office of Production Management, new "super-defense" council, established by executive order of Pres Roosevelt; William S. Knudsen was named director general and Sidney Hillman associate director general.
- 8. Budget minimum of \$17,485,528,049 in expenditures for fiscal year 1942, including \$10,811,314,600 for detense, presented to congress by Pres. Roosevelt; deficit was estimated at \$9,210,093,049. ¶ Husband E. Kimmel named commander in chief of U.S. fleet; navy was divided into



Help wanted notices posted on a street in Detroit, Mich., during 1941—a year marked by increased production in virtually all industries as a result of the U.S. program of "all aid short of war," embodied in the lend-lease bill

Pacific, Atlantic and Asiatic fleets.

- 9. Retreat of French forces on Cambodian frontier after battles with Thai troops admitted by military authorities in Indo-China. ¶ Harry L. Hopkins, special envoy of Pres. Roosevelt to Britain, arrived in London; he conferred next day with Churchill, Halifax and Eden.
- 10. Germany and U.S.S.R. signed trade agreement described by D.N.B., official nazi press association, as "largest grain deal in history." ¶ Fall of Klisura to Greek forces announced in Athens. ¶ Recapture of Buna in Kenya colony announced by British, who also claimed capture of El Wad in Italian Somaliland and start of advance into Eritrea.
- 11. German-Italian communiqué announced that first joint axis air attack in Mediterranean had damaged four British warships on Jan. 10.
- 12. Wendell L. Willkie endorsed U.S. lend-lease bill, but suggested time limit for presidential powers conferred by measure.
- 13. Gen. Ubaldo Soddu relieved as commander of Italian forces in Albania; Gen. Ugo Cavallero, chief of staff, succeeded him.
- 15. Sir Gerald Campbell appointed British minister to U.S.A. to assist Viscount Halifax, new ambassador.

- 17. Weapons, ships and planes, but no armies from U.S.A. in 1941, asked by Winston Churchill in Glasgow speech attended by Harry L. Hopkins. ¶ Kassala in Anglo-Egyptian Sudan recaptured by British.
- 18. Marshal Pétain and Pierre Laval composed differences after meeting, according to Vichy communiqué. ¶ Republican party would "never again gain control of the American government" if it endorsed a blind opposition to lend-lease bill, said Wendell L. Willkie in address at New York city. ¶ British aircraft carrier "Illustrious" bombed by nazi planes in Mediterranean for third time in eight days.
- 19. U.S.A. apologized to Germany for incident in which U.S. sailor ripped swastika flag from nazi consulate in San Francisco.
- 20. Franklin D. Roosevelt inaugurated for third term. ¶ British mechanized forces penetrated Eritrea to depth of 30 mi.
- 21. U.S.A. lifted "moral embargo" on aircraft and aviation gasoline levied against U.S.S.R. during Finnish war.
- 22. Tobruk fell to British after 36-hr. attack. ¶ Japan offered to mediate Thai-French dispute over Indo-China border.
- 23. Stalemate in World War II predicted by Col. Charles A. Lindbergh in testimony on lend-lease bill before house foreign affairs committee; he suggested a negotiated peace to end conflict.

- 24. Viscount Halifax, British ambassador to U.S.A., was personally welcomed to new post by Pres. Roosevelt aboard battleship "King George V" in Chesapeake bay. ¶ Bucharest reported collapse of Iron Guardist rebellion after estimated casualties of 6,000; gov't placed blame for uprising upon Horia Sima, Iron Guard leader.
- 27. Japanese Premier Konoye asked "forgiveness of the emperor and the people" for "billions of yen . . . spent and 100,000 officers and men sacrificed" in Chinese war.
- 28. Capture of Murzuk in southern Libya by Free French after forced march from Lake Chad region announced in broadcast by Gen. Georges Catroux, who led assault on Italian garrison.
- 29. Alexander Korizis appointed Greek premier following death of Gen. John Metaxas.
- 30. British entered Derna, Libya, after unexpected 3-day resistance by Italian defenders. ¶ Adolf Hitler declared that ships of any nationality bringing aid to Britain would be torpedoed; he prophesied that 1941 would see complete axis victory.
- 31. Thai-French armistice signed aboard Japanese cruiser at Saigon.

FEBRUARY, 1941

- 1. Sec'y of Navy Frank Knox told senate foreign relations committee he was "positive" the axis would invade western hemisphere if Britain were overwhelmed.
- 2. Fierce rioting broke out in Johannesburg, South Africa, between soldiers and anti-British demonstrators. § British armies captured Agordat, strategic mountain railroad town in Eritrea, 100 mi. west of Massawa.
- 3. Pres. Batista of Cuba ousted three "seditious" military leaders, assumed command of republic's armed forces and suspended constitutional guarantees for 15 days. ¶ U.S. supreme court upheld constitutionality of Wages and Hours law; in another decision, the court ruled that disputes between unions did not come under the Sherman Antitrust act.
- 4. British army of Nile drove 45 mi. beyond Derna and captured ancient city of Cyrene in Libya. ¶ Wendell Willkie flew to Dublin for a "frank, free discussion" with Eire Prime Minister Eamon de Valera. ¶ Lend-lease bill might involve U.S.A. in war in 90 days, Gen. Robert E. Wood of America First committee told senate foreign relations committee.
- 5. Wendell Willkie left London for U.S.A.; he asked newsmen to "tell the Germans" that "we German-Americans hate tyranny and the nazi regime."
- 6. Pres. Roosevelt named John G. Winant to succeed Joseph P. Kennedy as U.S. ambassador to Great Britain.
- 7. British forces in Africa captured Bengasi, major Italian port in east Libya.
- 8. Lend-lease bill, empowering Pres. Roosevelt to transfer military equipment to Britain, passed in house of representatives by vote of 260 to 165.
- 9. British warships hurled 300 tons of shells into Genoa. ¶ Pierre Etienne Flandin resigned from foreign ministry in Vichy cabinet and was succeeded by Adm. Jean Darlan, who also took over post of vice-premier.
- 10. Great Britain broke off diplomatic relations with Rumania.
- 11. Wendell Willkie, in U.S. after war tour of England, urged U.S. to speed aid to Britain.
- 14. Bill raising the ceiling on U.S. national debt from \$49,000,000,000 to \$65,000,000,000 approved by senate. ¶ British parachute troops landed in southern Italy in at-

tempt to sabotage communications; Rome reported all were captured.

- 15. Pres. Roosevelt dispatched James B. Conant, president of Harvard university, to England on mission to exchange war science data with British.
- 16. Britain in desperate and immediate need of U.S. help, declared Harry Hopkins on return from four-week trip in England.
- 17. Japan, through official spokesman, offered its services to end all wars, and blamed U.S. and Britain for continued conflict. ¶ Bulgaria and Turkey signed nonaggression pact. ¶ Supreme court upheld decision sentencing Earl Browder, general sec'y of U.S. Communist party, to four years in prison for passport fraud.
- 18. Large Australian army landed at Singapore; Canadians advised to leave China and Japan. ¶ U.S. Undersec'y of State Sumner Welles rejected Japan's mediation offer; said United States was more interested in deeds than in words.
- 20. British armies crossed Juba river and penetrated Italian Somaliland.
- 21. Soviets expelled Maxim Litvinov, former foreign commissar, from central committee of Communist party for "inability to discharge obligations."
- 24. Hitler announced in a speech in historic Munich beer-cellar that he was planning a gigantic U-boat war against Britain. ¶ "White race must cede Oceania" to the Japanese, Foreign Minister Yosuke Matsuoka told Japanese diet. ¶ Communist party of U.S. named Robert Minor as general sec'y.
- 25. Pres. Roosevelt placed bans on export of beryllium, graphite electrodes, atropine, belladonna, sole leather and belting leather. ¶ Soviet union approved budget of 215,400,000,000 roubles, a third of which was earmarked for national defense.
- 26. British armies captured Mogadishu, capital of Italian Somaliland, climaxing 220-mi. dash in 48 hr.
- 27. Italy sent Spain a bill for 7,500,000,000 lire for aid given Franco during Spanish Civil War.
- 28. A plan offered by the Office of Production Management ended C.I.O. strike at Bethlehem Steel corporation's Lackawanna plant. ¶ U.S. completed secret removal of \$8,500,000,000 in gold from New York city to subterranean gold vaults at Fort Knox, Ky.

MARCH, 1941

- 1. Bulgaria signed Rome-Berlin-Tokyo pact, permitting German troops to march into Sofia. ¶ German military authorities fined the city of Amsterdam 15,000,000 guilders as a penalty for disorders against nazi occupation.
- 2. Turkey closed Strait of Dardanelles to all ships, except those having special permits.
- 5. Former King Carol of Rumania and Mme. Lupescu fled Spain and crossed frontier into Portugal.
- 6. U.S. requested Italy to close two consulates in U.S. and to restrict the movements of Italian consular agents.
- 7. Italian Somaliland fell to British troops; Italians fled into Ethiopia.
- 8. Senate passed lend-lease bill by vote of 60 to 31. ¶ Rumanian Premier Antonescu gave Hitler, Goering and Mussolini power to veto all Rumanian economic agreements with foreign countries. ¶ Greeks resumed offensive in Albania.
- 10. Marshal Pétain appealed to U.S. for food to ward off famine in France; Vice-Premier Admiral Darlan said French navy would fight if Britain interfered with food convoys. § France, under Japanese pressure, ceded Indo-Chinese territories to Thailand (Siam).

- 12. Prime Minister Churchill thanked the U.S. for enacting the lend-lease bill, which he termed a "new Magna Carta."
- 15. Pres. Roosevelt in radio speech told U.S. that entire nation had to make sacrifices in order to defeat dictatorships.
- 16. No help could save Britain, Chancellor Hitler told audience of nazi leaders.
- 19. Pres. Roosevelt announced creation of 11-man board to mediate strikes involving defense industries. ¶ U.S. and Canada signed pact to develop Great Lakes-St. Lawrence waterway "for defense purposes."
 - 20. Plymouth shattered by nazi air raid.
- 21. Three Yugoslav ministers quit cabinet in protest against gov't's readiness to join axis. ¶ New York bus strike ended after 11 days.
- 22. Grand Coulee dam in Washington started operation, two years ahead of schedule.
- 25. U.S.S.R. and Turkey exchanged neutrality pledges. ¶ Yugoslav Premier Cvetkovitch and foreign minister signed axis pact in Vienna. ¶ Marshal Graziani "retired at his own request" as commander of Italian armies in Libya and as chief of the Italian general staff.
- 26. Yugoslavs revolted against axis pact; heavy police detachments guarded Belgrade.
- 27. Yugoslav army ousted pro-axis government leaders and placed young King Peter II on throne. Gen. Dushan Simovitch, new premier, rushed mobilization of 1,200,000 men. ¶ British troops seized Cheren in Italian Eritrea.
- 28. Bethlehem plant in Johnstown, Pa., and C.I.O. strikers signed agreement to end walkout, while C.I.O. workers at another Bethlehem plant in Cambria, Pa., started new strike.
- 29. British Mediterranean fleet battered Italian naval units off Cape Matapan, Greece, sinking three cruisers and two destroyers and crippling a 35,000-ton battleship.
- 30. U.S. seized 65 axis-controlled ships docked in U.S. ports. ¶ French shore batteries in Algeria fired on British naval units attempting to intercept a French convoy. ¶ C.I.O. strikers voted to return to work at International Harvester plant in Chicago. ¶ German and Italian nationals fled from Belgrade.

APRIL, 1941

- 1. Germans charged Yugoslavs with persecution of German racial minorities. § British forces in Africa captured Asmara, capital of Italian Eritrea.
- 3. Nazi-Italian armoured units in Libya forced British troops to evacuate the port of Bengasi.
- 4. German armies, pouring through Hungary, Rumania and Bulgaria, massed at frontiers adjacent to Yugoslavia and Greece. ¶ Pro-axis leader in Iraq ousted pro-British premier in coup d'état.
 - 5. Aduwa fell to British troops in Ethiopia.
- 6. Nazi armies invaded Yugoslavia and Greece; Hitler denounced Belgrade government for "intriguing" with Britain; U.S.S.R. signed 5-year nonaggression and friend-ship pact with Yugoslavia; nazis bombed Belgrade. ¶ Addis Ababa capitulated to British army in Ethiopia. ¶ U.S. Defense Mediation board won agreement from both management and union to end 75-day Allis-Chalmers strike.
- 7. Royal air force bombed Sofia, Bulgaria; Yugoslavs took Scutari in Albania after launching offensive against Italian forces; Greeks lost Thrace to nazi armoured units. § London severed diplomatic relations with Budapest. § Britain raised basic income tax rate 50% to 10 shillings on the pound. § "Honour" forbade French attack on Brit-

- ish, Marshal Pétain declared in broadcast.
- 8. German army broke through Vardar valley pass, menacing Greek force defending Salonika; nazi forces in Yugoslavia took Skoplje. ¶ Axis forces in North Africa captured Libyan port of Derna; British retreated to Tobruk.
- 9. Nazi army captured Salonika, splitting Greece in two; Yugoslav army pierced Italian line in northern Albania, taking two towns; Nish fell to German troops advancing in Yugoslavia. ¶ British planes bombed heart of Berlin, damaging State Opera house and other buildings. ¶ German and Italian forces in Libya captured six British generals and 2,000 men; British took Massawa, port in Italian Eritrea.
- 10. U.S. revealed agreement with Danish envoy in Washington giving U.S. right to build bases on Greenland. § 80,000 Greek prisoners taken in fighting east of Vardar river valley, German high command announced; Berlin also reported capture of 20,000 Yugoslav prisoners and important gains in Yugoslavia.
- 11. Ten-day Ford strike settled by Governor Van Wagoner of Michigan. ¶ Nazi mechanized units launched attack against Anglo-Greek flank in the Florina area; German troops swept through Yugoslavia and made contact with their Italian allies; Hungarian armies invaded Yugoslavia.
- 12. Italians claimed advance in Yugoslav-Albanian frontier sector; Hungarian army occupied Subotica; U.S.S.R. denounced Hungary for invading Yugoslavia. ¶ Nazi-occupied Denmark declared "void" the agreement signed between U.S. and Danish envoy in Washington.
- 13. Soviet union and Japan signed neutrality pact under which Russia recognized Tokyo's suzerainty over Manchuria while Tokyo pledged to respect the Moscow-dominated Outer Mongolian People's republic. ¶ Nazi mechanized troops occupied Bardia in Libya, driving British forces back across the Egyptian frontier. ¶ Stiff Anglo-Greek resistance slowed German drive in Balkans; nazi troops occupied Belgrade.
- 14. German-Italian motorized forces crossed the Egyptian frontier, taking town of El Sollum. ¶ British troops retired to new defense line in Greece near Mount Olympus; German high command said Yugoslav army was virtually destroyed.
- 15. Nazi army advanced 50 mi. into Greece; Italian forces launched twin offensive on the Greek-Albanian frontier; Hitler and Mussolini gave recognition to new, independent state of Croatia.
- 16. Nazis established new line 60 mi. within Greece; surrender of the second Yugoslav army based at Sarajevo announced by German high command; Greek troops abandoned Kortcha to Italian forces on Albanian front.
- 17. Entire Yugoslav army surrendered; German tank divisions methodically drove back Greece and British armies. ¶ Axis drive eastward along North African coast stalled near Egyptian frontier. ¶ U.S. motorcar industry voluntarily agreed to cut production by 1,000,000 cars, beginning Aug. 1, 1941.
 - 18. Allied armies in Greece retired to new lines.
- 19. Nazi troops captured Mt. Olympus from Australian units. ¶ British landed strong forces in Iraq to guard Mosul oil fields. ¶ Vichy dispatches said 53 French vessels had been "requisitioned," presumably by nazis.
- 21. Emmanuel Tsouderos became Greek premier, succeeding Alexander Korizis, who had committed suicide.
- 22. King George II of Greece fled Athens for Crete as the Greek army of Epirus and Macedonia surrendered to nazis; British held mountain pass at Thermopylae.

- 24. Allied rear-guard troops delayed German forces at Thermopylae pass; nazi bombers pounded Peiraeeus, port of Athens, while German mechanized divisions advanced to within 35 mi. of the Greek capital.
- 25. Immediate extension of U.S. neutrality patrol areas in Atlantic waters was announced by Pres. Roosevelt.
- 26. German panzer units raced across Corinth canal in effort to trap fleeing Allied troops near Athens.
- 27. Increasing U.S. aid would help British empire pass through the "long, stern, scowling valley" of war to victory, Churchill declared in a broadcast to the empire and the U.S. § Nazi mechanized divisions marched into Athens; German forces also occupied Patras on the Peloponnesus.
- 28. British imperial armies continued to evacuate Greece; Berlin claimed destruction of 285,000 tons of British shipping in Greek waters; Italian troops occupied Corfu. ¶ Col. Lindbergh resigned his commission as a reserve officer in the U.S. air corps, declaring that Pres. Roosevelt's remarks questioning his loyalty left him "no honourable alternative." ¶ U.S. supreme court decision ruled that Negroes are entitled to train accommodations equal to those given white passengers. ¶ The 28-day strike of the soft-coal miners in the U.S. ended as coal operators in the southern states agreed to a wage boost of \$1 per day. ¶ The Venezuelan congress elected Gen. Isaias Angarita Medina president of Venezuela.
- 29. Soviet union banned shipment in transit through U.S.S.R. of war materials destined for foreign use.
- 30. British succeeded in evacuating 48,000 of the 60.000 troops originally landed in Greece, Churchill told commons.

MAY, 1941

- 1. U.S. Maritime commission announced plans were underway to shift 50 U.S. oil tankers to the service of Britain. § Lord Beaverbrook was transferred from the ministry of aircraft production and became British minister of state.
- 2. Iraqi artillery shelled the British forces holding the Habbania aerodrome.
- 3. British beat back Iraqi troops in the Basra area while R.A.F. planes bombed Iraqi batteries shelling British gar-

- rison in Habbania airfield. ¶ Italy annexed Ljubljana. capital of Slovenia—a Yugoslav territory—and the area surrounding it.
- 4. Pres. Roosevelt declared the U.S. "ever ready to fight again" for its existence; Hitler boasted that Germany and its allies could defeat "any possible coalition in the world"
- 6. U.S. Sec'y of War Stimson urged the United States to use its navy to escort war supplies to Britain. ¶ Joseph Stalin assumed the premiership of the soviet union following the resignation of Vyacheslav Molotov from that office; Molotov, however, continued in the post of foreign commissar. ¶ The U.S. banned all exports to the soviet union of machinery or equipment needed for U.S. defense production. ¶ Haile Selassie returned to the Ethiopian throne he lost in 1936 to Italian armies.
- 7. House of commons approved Britain's war policy in a 447 to 3 vote of confidence given to Churchill. ¶ British land forces, aided by the R.A.F., succeeded in breaking the siege laid by Iraqi troops around Habbania aerodrome. ¶ German authorities, in a deal with French Vice-Premier Darlan, agreed to cut the cost of military occupation of France by 25%.
 - 8. Axis planes raided the Suez canal zone.
- 9. 300 British planes poured tons of bombs over Hamburg and Bremen. ¶ Soviet Russia withdrew diplomatic recognition from the exiled governments of Yugoslavia, Belgium and Norway.
- 10. 1,443 merchantmen totalling 5,961,044 tons employed in British interests had been sunk since the war began, the admiralty disclosed. ¶ Rudolf Hess, Hitler's personal deputy, flew to Scotland and made a parachute landing near Glasgow; he broke his ankle on landing, was rushed to a hospital and held incommunicado.
- 11. Nazi bombers showered London with 100,000 bombs, destroying house of commons chamber and damaging Westminster abbey, Westminster hall and Egyptian section of the British museum.
- 12. German statement on the flight of Rudolf Hess to Scotland said the nazi leader was suffering from "hallucinations and a mental disease."
- 13. Germans proclaimed the northern part of the Red sea a war zone.

Wreck of the Messerschmitt plane from which Rudolf Hess, Hitler's deputy, made a parachute jump onto Scottish soil after his sensational flight from Germany, May 10, 1941



- 15. Marshal Pétain placed his stamp of approval on Darlan-Hitler talks and appealed to the French people to follow him on the road of "honour and national interest." ¶ Pres. Roosevelt, concerned over Franco-German "collaboration," appealed to the French people not to support the Pétain policy. ¶ U.S. coast guard seized every French vessel, including the "Normandie," in U.S. harbours. ¶ Bolivian gov't decreed expropriation of the Lloyd Aereo Boliviano, a German air line operating in Bolivia. ¶ Completed five months ahead of schedule, the 35,000-ton U.S. battleship "Washington" joined the fleet.
- 16. Key town of El Sollum on the Libyan border was stormed and recaptured by British.
- 17. The axis air forces and the R.A.F. traded blows in the near east, with German planes bombing British positions and British raiders attacking German and Italian concentrations in French-controlled Syria. ¶ The soviet gov't concluded a diplomatic and trade agreement with the new Iraqi gov't.
- 18. The duke of Spoleto, cousin of King Victor Emmanuel III, became king of Croatia.
- 19. Mayor La Guardia was named by Pres. Roosevelt to head Office of Civilian Defense. ¶ Italian force of 7,000 commanded by the duke of Aosta surrendered to British forces in Alagi, Ethiopia.
- 20. The nazis launched an aerial invasion of Crete, landing 7,000 parachute troops from gliders. ¶ British troops seized Feluja, Iraq, 35 mi. west of Baghdad.
- 21. The German foreign office asked the U.S. to withdraw its diplomatic representatives from Paris, the state dep't announced. ¶ A submarine, presumably German, sank the U.S. freighter "Robin Moor" in the South Atlantic.
- 22. Air-borne nazi parachute troops won a foothold on Crete, seizing Candia and Maleme airport and forcing withdrawal of R.A.F. from the island. § British forces in Iraq established new positions only 20 mi. from Baghdad.
- 23. German planes landed reinforcements at Maleme aerodrome as nazi air-borne contingents renewed their drive to oust Allied forces from Crete. ¶ R.A.F. bombers crushed Iraqi counterattack against British at Feluja.
- 24. The "Hood," 42,500-ton British battle cruiser, was blown to bits by the 35,000-ton German battleship "Bismarck" between Greenland and Iceland. ¶ German parachute troops were firmly entrenched in western Crete while nazi bombers continued to blast British warships.
- 25. U.S. convoys aiding Britain would be regarded as a "plain act of war," German Grand Admiral Erich Raeder announced in an interview. ¶ Britain threw a giant naval dragnet around the northeastern Atlantic in the quest for the German battleship "Bismarck." ¶ Narrowly escaping capture, King George of Greece fled Crete for Cairo.
- 26. A new draft of all men who reached 21 after the first registration was ordered by Pres. Roosevelt; it was estimated 1,000,000 youths would be affected. ¶ German forces in Crete drove back British imperial armies to points 15 mi. from Suda bay. ¶ Eire Prime Minister de Valera warned Britain not to apply conscription to Ulster.
- 27. The German battleship "Bismarck" was sunk 400 mi. off the French coast after a running sea battle with British. ¶ Pres. Roosevelt proclaimed an unlimited national emergency to place the U.S. on a war footing. ¶ Churchill abandoned the plan to apply conscription to Northern Ireland to avoid friction with the government of Eire.
- 28. Germany's air-borne army captured Canea, capital of Crete, and pressed drive to oust British warships from Suda bay.

- 29. British armies started to evacuate Crete following nazi seizure of Suda bay and Candia.
- 30. Iraq Premier Rashid Ali fled to Iran as British troops reached the outskirts of Baghdad.
- 31. An armistice was signed in Baghdad between Britain and Iraq, ending month-old war.

JUNE, 1941

- 1. The abandonment of Crete to the axis was admitted by the British war office in an announcement declaring 15,000 troops were safely evacuated from the island.
- 2. Hitler and Mussolini conferred for five hours at the Brenner pass on axis military and political moves. ¶ Charles Evans Hughes retired as chief justice of the U.S. supreme court.
- 4. The R.A.F. bombed Beirut, in preparation for an invasion of the French mandated territories of Syria and Lebanon. ¶ Axis planes staged their first air raid on Alexandria, Egypt, killing an estimated 150 persons and injuring 200 others.
- 6. Rumours that the British were seeking peace were branded by Pres. Roosevelt as falsehoods deliberately circulated by nazis. ¶ Bill authorizing the U.S. to requisition foreign ships lying idle in U.S. harbours was signed by Pres. Roosevelt.
- 8. An Allied force of British and Free French troops invaded Syria from three points.
- 9. Allied forces pushing into Syria neared the key cities of Damascus and Beirut.
- 10. A majority of strikers at the North American Aviation plant voted to return to their jobs. § The U.S. was already in the war, declared Premier Mussolini in a speech to the Italian nation.
- 11. C.I.O. strikers at aluminum plant in Cleveland accepted U.S. Defense Mediation board's plan to resume work on defense orders totalling \$60,000,000. ¶ The massing of nazi troops on soviet frontiers increased tension between the reich and U.S.S.R.
- 12. Harlan Fiske Stone was appointed chief justice of the U.S. supreme court by Pres. Roosevelt; Sen. James F. Byrnes (Dem., S.C.) and Attorney General Robert H. Jackson were named associate justices.
- 14. Pres. Roosevelt ordered immediate freezing of all assets of axis and axis-occupied countries; Japan was not included in the order.
- 15. Italy retaliated for U.S. action in holding axis assets by freezing U.S. funds in Italy.
- 16. Closing of all German consulates, travel and propaganda agencies in the U.S. was ordered by the state department. ¶ Sec'y Ickes banned shipment of 252,000 gal. of lubricating oil bound for Japan.
- 18. Germany and Turkey signed a ten-year friendship treaty.
- 19. Germany and Italy expelled U.S. consuls in reprisal for action closing all axis consulates in the U.S.
- 20. Finland ordered general mobilization. ¶ Ford Motor company signed union shop contract with the United Automobile Workers (C.I.O.).
- 21. Damascus fell to British and Free French forces in Syria.
- 22. German armies launched an invasion of U.S.S.R. on three huge fronts stretching from the Baltic to the Black sea; nazi panzer units penetrated Russian Poland. § British Prime Minister Churchill promised economic and technical support for U.S.S.R.; any state that fought against Hitler would have British aid, he added. § Following the

lead of its axis partner, Italy declared war on U.S.S.R.; Turkey proclaimed its neutrality.

23. German mechanized forces captured Brest-Litovsk.

24. Pres. Roosevelt pledged U.S. to give U.S.S.R. all possible aid and ordered the release of \$40,000,000 in soviet credits frozen June 14.

25. Nazi panzer divisions penetrated soviet lines south of Kaunas and east of Warsaw; Sweden affirmed its neutrality, but announced that permission had been granted for the passage of one nazi division from Norway across Swedish territory to Finland; Pres. Roosevelt announced the neutrality act would not be invoked against Russia.

26. German motorized divisions cracked Russian lines between Grodno and Bialystok to reach lines 50 mi. from Minsk; another panzer force reached the sector between Luck and Brody; Finland entered the war on the side of the nazis in a "defensive capacity," according to Pres. Risto Ryti.

27. Russian troops retreated along a broad sector stretching from Lithuania to the Pripet marshes to prepared positions defending Minsk; Hungary declared war on the soviet union.

28. 4,000 German and Russian tanks engaged in battle in the Luck sector of Russian-held Poland; nazi divisions neared Minsk; Nazi-Finnish forces launched a dual drive aimed at capturing Murmansk and Leningrad.

29. German tank divisions passed beyond Minsk.

¶ Churchill appointed Lord Beaverbrook minister of

supply.

30. Minsk fell to twin German armies converging on the road leading from Borisov to Smolensk; a third nazi army based at Przemysl pierced Ukraine defenses and captured Lwow. § The Vichy gov't severed diplomatic relations with U.S.S.R.

JULY, 1941

- 1. German armies captured Riga; Berlin admitted stiff Russian resistance. ¶ Gen. Sir Archibald Wavell was relieved of the British middle east command and replaced by Gen. Sir Claude Auchinleck; Gen. Wavell took over the India command left by Gen. Auchinleck. ¶ Soviet Russia asked the U.S. for help and offered to pay for war supplies, U.S. state department announced. ¶ Germany and six axis satellites recognized the Japanese-controlled puppet regime in Nanking. ¶ Federal Power commission ordered creation of a 17-state power pool in the southeast U.S.
- 2. The North American Aviation Co. at Inglewood, Calif., taken over by the army on June 9 after a strike closed the plant, was returned to owners.
- 3. Soviet Premier Joseph Stalin exhorted the Russian people to defend their soil by adopting a "scorched earth" policy. ¶ Russian and German panzer units fought for control of the Berezina river in the Bobruisk and Borisov sectors. ¶ Gen. Marshall, U.S. chief of staff, asked for immediate legislation to extend the military service of conscripts and national guardsmen and to permit use of U.S. armed forces beyond the western hemisphere.
 - 4. Red army blunted nazi drive to cross the Berezina.
- 5. Soviet counterattacks checked nazi armoured divisions in the Baltic and White Russian arenas of the Russian front; panzer divisions, far ahead of the nazi main lines, reached outposts of the Stalin line at the Dnieper river, only 300 mi. from Moscow. ¶ R.A.F. units bombed the French "invasion coast" and Rhenish industrial cities for the 21st consecutive day.

- 6. A century-old border wrangle between Peru and Ecuador flared into clashes between border patrols and rival air forces. ¶ Red army took the offensive in the Lepel and Borisov sectors; German panzer divisions were halted at the Dvina river; nazi-Rumanian army was repulsed north of Jassy. ¶ Ten Italian generals and 5,000 Italian troops surrendered to British armies in Ethiopia.
- 7. Occupation of Iceland by U.S. naval and marine units announced to congress by Pres. Roosevelt.
- 8. Nazi war machine was stalled on five principal sectors of the Russian front.
- 9. German mechanized units resumed their drive into U.S.S.R. ¶ Gen. Henri Dentz, commander of the Vichy forces in Syria, was authorized by the Pétain government to ask the British for an armistice.
- 10. Iceland parliament approved by a 39 to 3 vote the Reykjavik government's agreement permitting U.S. armed forces to occupy the island.
- 12. Nazi forces took Vitebsk and crossed the Dvina river, menacing Smolensk. ¶ An armistice to end the war in Syria was concluded between the British and Free French forces and the Vichy command.
- 13. Great Britain and soviet Russia signed a mutual aid pact. ¶ Moscow admitted the loss of 250,000 men, but claimed the nazis had lost 1,000,000.
- 14. Japan closed the port of Kobe to foreigners for a 10-day period.
- 15. German planes blasted a path for tank columns moving on Leningrad; a nazi force swept to within 100 mi. of the northern metropolis; Russian counterdrives pushed back German armies along the Dnieper river. ¶ 33 persons were indicted in a federal court in Brooklyn on charges of acting as German espionage agents. ¶ Churchill told commons that the Soviet-British mutual aid pact meant that "the Russian people are now our allies."
- 16. German high command claimed capture of Smolensk, 230 mi. from Moscow; Russian forces checked nazi units in the Bobruisk and Novograd Volynsk sectors; Russian air fleet bombed Ploesti oil fields in Rumania. ¶ Cabinet of Prince Fumimaro Konoye in Tokyo resigned.
- 17. Pres. Roosevelt issued a black-list order freezing funds in the U.S. of 1,800 Latin-American firms having axis ties. § The second draft lottery to determine the order in which an estimated 750,000 youths 21 years old would be drafted into the U.S. army was held in Washington.
- 18. Japanese Premier Prince Konoye formed a new cabinet, the third headed by him.
- 19. Germans announced the "disintegration" of the Russian front, declaring that Leningrad, Moscow, Kiev and Odessa were threatened by nazi armies; Stalin assumed the post of defense commissar of the soviet union. ¶ Bolivia nipped a subversive plot laid to axis agents, declared a state of siege and demanded the ouster of the German minister.
- 20. The British launched a propaganda campaign called the "V for Victory" drive and designed to stir revolts in axis-occupied countries.
- 22. German-Finnish forces pressed drive on the Leningrad front; Moscow admitted nazi gains in the southern Ukraine sector.
- 23. Vichy yielded to Tokyo's demands for military bases in Indo-China.
- 24. Russian armies claimed to have stopped German drives in vicinities of Leningrad and Smolensk.
- 25. Acting together to balk further Nipponese aggression in the far east, the U.S. and Britain froze all Japanese assets.
 - 26. Pres. Roosevelt placed armed forces of Philippines

- 28. Netherlands Indies suspended oil agreement with Japan in a general order freezing all Japanese assets.
- 29. Nazi forces in the Smolensk area were dislodged by counterattacking Russian units, the red army claimed.
- 30. Pres. Roosevelt asked congress for authority to establish ceilings on living costs to avert inflation. ¶ U.S.S.R. and Polish government-in-exile signed agreement ending state of war between the two countries; U.S.S.R. agreed to recognize the Polish frontiers prior to the soviet-nazi pact of Sept. 1939. ¶ Washington protested to Tokyo over the bombing of an American gunboat, "Tutuila," at Chungking, China.
- 31. Japan's prompt apology for the bombing of the "Tutuila" was accepted by the U.S. ¶ Pres. Roosevelt created an economic defense board and named Vice-President Henry Wallace to head the new agency. ¶ The R.A.F., in the first direct military support given by Britain to Russia, attacked the Finnish port of Petsamo and the naziheld port of Kirkenes in Norway.

AUGUST, 1941

- 1. Pres. Roosevelt banned export of aviation gasoline and oil to all points outside the western hemisphere, excepting the British empire and "countries resisting aggression."
- 5. Germans claimed to have widened the Smolensk gap in their drive on Moscow; Russians reported the halting of twin nazi drives on Kiev.
- 8. 25 soviet divisions were trapped in a nazi pincer movement in the Ukraine, according to German high command.
- 9. Germans hurled large masses of men and material in a new attack on all three major fronts of the Russian theatre of war.
- 11. Russian armies defending the Odessa and Krivoi Rog sectors in the Ukraine area were reported perilled by a German "pocket" movement.
- 12. Bill extending army service to 30 months was approved by single vote in house of representatives; final ballot was 203 to 202. ¶ Marshal Pétain pledged his Vichy regime to collaboration with Adolf Hitler's "new order." ¶ German panzer divisions reached the Black sea coast near Odessa and Nikolayev.
- 14. In a historic meeting aboard a British battleship "somewhere in the Atlantic," Pres. Roosevelt and Prime Minister Churchill agreed on an eight-point declaration of war and peace aims. ¶ German armies captured Krivoi Rog in the southern Ukraine; Russians admitted the loss of Pervomaisk and Kirovo, key towns in the defense of Odessa.
- 15. Leon Henderson, OPACS administrator, ordered a temporary 10% cut in gasoline deliveries to retailers in 17 eastern states.
- 17. The fall of Nikolayev, Black sea naval base, was admitted in Moscow. ¶ Anglo-soviet trade treaty was signed, under which London would lend Moscow £10,000,000 to facilitate commerce exchanges. ¶ Russian troops withdrew from Kingisepp, 70 mi. S.W. of Leningrad, Moscow communiqué said.
- 19. The German army hammered Russian forces falling back toward Leningrad; the Germans laid siege to Odessa and claimed victories in salients near the Dnieper river.
- 21. German troops took the cities of Narwa and Novgorod in their drive on Leningrad; Russians admitted the fall of Gomel in the Kiev sector, while the nazis claimed capture of Kherson, a river port on the lower Dnieper.
 - 22. Finnish troops announced the capture of Kaekisalmi,

- 75 mi. N. of Leningrad; soviets evacuated Nikopol on the Dnieper's west bank, Moscow said.
- 23. The U.S. took over the Federal Shipbuilding and Dry Dock Co. in Kearny, N.J., where construction of naval and merchant ships had been halted by a strike. ¶ Red army forces launched counterattack in Gomel sector.
- 24. Prime Minister Churchill told Japan that Britain would range itself on the side of the U.S. in the event of far eastern trouble.
- 25. Russian and British troops simultaneously marched into Iran. ¶ Vichy reported 20,000 German troops were assigned to help French police crush agitation in Paris and suburbs.
- 26. U.S.S.R. warned Japan that any effort to interfere with Russo-American trade in the far east would be considered an unfriendly act. ¶ British troops occupied vital oil areas in southern Iran while Russian forces to the north marched into Tabriz. ¶ Hitler's armies captured Dnepropetrovsk in the Ukraine after Russians had blown up huge Dnieper dam.
- 27. German forces crossed the Dnieper river and seized Zaporozhe, Berlin reported.
- 28. In an effort to speed up arms production, Pres. Roosevelt created a seven-man Supply Priorities and Allocations board, headed by Vice-President Wallace with Donald M. Nelson as executive director. ¶ New Iran government ended resistance to the invasion of soviet and British troops.
- 29. Adolf Hitler and Benito Mussolini held a five-day parley on the Russian front. ¶ German land, sea and air forces took Tallinn, capital of Estonia, after bitter fighting, Berlin announced. ¶ U.S. war department announced plans to release 200,000 men from army service by Dec. 10, 1941, with special consideration given to dependency cases, conscripts and national guardsmen over 28 and enlisted men with three years of duty.
- 30. Finns captured Viborg, taken by the Russians after the Russo-Finnish War of 1939-40.
- 31. Soviet forces launched heavy counterassaults against nazi positions in the central sector and along the Dnieper river in the Ukraine.

SEPTEMBER, 1941

- 1. Pres. Roosevelt called for more energy to defeat Hitler's "insane violence" and declared he could not betray the cause of freedom with a negotiated peace. ¶ Mexican President Avila Camacho pledged Mexican armed forces to western hemisphere defense, but declared that Mexico desired to stay out of the war. ¶ Vichy persuaded German authorities in Paris to abandon plans for mass execution of Jewish hostages, according to Fernand de Brinon, Vichy's envoy to Paris.
- 2. Berlin reported nazi troops entered the suburb of Krasnoe Selo, only 20 mi. from Leningrad. ¶ Mussolini and Hitler decided at their Russian front meeting to unite all Europe into a single axis-dominated state based on "harmonious co-operation of all European peoples," Il Popolo d'Italia, Duce's newspaper, announced.
 - 3. German armies in Ukraine drove toward Kharkov.
- 4. Nazi U-boat attacked U.S. destroyer "Greer," en route to Iceland; the "Greer" counterattacked with depth charges. ¶ U.S. state department sanctioned sale of oil to Spain.
- 5. Long-range German artillery shelled Leningrad; Moscow said Russian troops counterattacked in the Leningrad area. ¶ British submarines torpedoed five Italian ships,

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including 23,635-ton liner "Duilio" and a 10,000-ton cruiser, in Straits of Messina.

6. Russian defenders of Leningrad hurled nazi columns back; Moscow reported new nazi thrusts at Kiev repulsed and said soviet armies on lower Dnieper river still held Zaporozhe.

7. Red army forces gave ground slightly before nazi troops pressing toward Leningrad. ¶ Moscow ordered removal of Volga Germans to Siberia in move to forestall

possible sabotage.

8. British war office announced that an Allied force landed on Spitsbergen and destroyed coal mines and a radio station. ¶ German motorized units took Schlusselburg and reached the Neva river in the drive to ring Leningrad, Hitler's headquarters announced.

9. Marshal Timoshenko's red army troops tore 15-mi. gap in nazi central front positions and recaptured Elnya. ¶ U.S. and Britain reached trade agreement under which latter agreed to cut drastically its export trade.

10. Threatening unrest among Norwegian workers led nazi authorities to place Oslo area under martial law. ¶ Red army troops pursued retreating German units in the Gomel and Smolensk sectors.

11. Pres. Roosevelt ordered U.S. navy to shoot first if axis raiders entered American defense zones. ¶ The "Montana," U.S.-owned freighter, was torpedoed in waters 260 mi. S.W. of Iceland. ¶ Prime Minister Churchill defended his minister of aircraft production, J. T. C. Moore-Brabazon, against charges that latter was cool to British efforts to aid Russia. ¶ Soviet Foreign Commissar Molotov formally charged that Bulgaria was serving as axis base.

12. Authorized German spokesman asserted that President Roosevelt's "shoot first" order would compel the reich to take fitting countermeasures. ¶ Russian high command announced withdrawal of red army troops from Chernigov, key city midway between Kiev and Gomel. ¶ German authorities made mass arrests in Norway to foil possible revolt by \$50,000 trade unionists, Swedish reports said.

13. Russians claimed Marshal Semyon Timoshenko's central front armies hurled back German thrust at Bryansk, 220 mi. S.W. of Moscow; two nazi tank corps commanded by Col. Gen. Heinz Guderian were reported routed.

14. An R.A.F. wing, complete with ground crews and materiel, arrived in U.S.S.R., British air ministry announced. § Finnish hopes for early peace were voiced by Vaino Tanner, Finnish trade and communications minister.

15. Sec'y of Navy Knox told American Legion convention in Milwaukee that, beginning Sept. 16, the U.S. navy would start to protect ships carrying lend-lease aid between the American continent and Iceland. ¶ President Roosevelt's report to congress on lend-lease aid disclosed that \$6,281,237,421 had been allocated for aid and that \$388,912,115 of this amount had been spent up to Aug. 31. ¶ Argentine Chamber of Deputies approved a resolution censuring German Ambassador Baron Edmund von Thermann for abusing his diplomatic privileges.

16. Riza Shah Pahlavi of Iran abdicated because of "failing health"; his son, 21-year-old Mohammed Reza Pahlevi, succeeded to throne. ¶ Pres. Roosevelt made Edward R. Stettinius, Jr., his special aid and gave him broad powers to speed arms shipments to Britain and its allies. ¶ U.S. navy dep't announced that all contracts for the 2,831 ships needed for two-ocean fleet had been awarded.

17. German armies widened their bridgehead on east bank of Dnieper. ¶ RFC contracted for purchase of \$100,000,000 in soviet metal ores in return for Russian purchases of U.S. goods. ¶ Bulgaria asked Turkey to open Strait of Dardanelles to 13 warships. ¶ American Legion in annual convention at Mılwaukee adopted resolution backing Roosevelt's foreign policy and approving use of U.S. forces on foreign soil if war became unavoidable.

18. Pres. Roosevelt asked congress for new appropriation of \$5,985,000,000 under lend-lease program. ¶ Stalin ordered conscription of all civilian males in U.S.S.R. between 16 and 50 not already in military service, for training, after working hours, in use of war weapons. ¶ Lynn U. Stambaugh was named national commander of American Legion.

19. German panzer spearhead entered Kiev; nazi drive 200 mi. south captured Poltava.

20. Berlin reported German troops were mopping up Kiev and pocket to east where 200,000 soviet soldiers were said to be trapped. ¶ Pres. Roosevelt signed new tax bill of \$3,553,400,000.

21. Nazi panzer divisions breached Russian lines and reached Sea of Azov, cutting off Crimea; Berlin reported Marshal Budenny's force of 150,000 men trapped east of Kiev faced total annihilation.

23. Pres. Roosevelt disclosed U.S. plan to arm merchant ships. ¶ Sec'y of Navy Knox urged repeal of neutrality act in speech at launching of new 35,000-ton battleship "Massachusetts." ¶ Argentine troops occupied two vital aerodromes in move to foil plot of young aviation officers laid to nazi inspiration. ¶ Formation in London of French National council to serve as a provisional government was announced by Free French Leader Gen. Charles de Gaulle.

24. 11 allied governments pledged adherence to Roosevelt-Churchill "Atlantic charter."

25. U.S.S.R. hurled great masses of troops at nazi concentrations east of Dvina river 300 mi. below Leningrad. ¶ Widespread activities of Serbian guerrillas led Rome to dispatch Italian troops to reoccupy Croatian demilitarized zone.

27. Nazi stuka planes strafed Serbian guerrillas while bombers and big guns razed the town of Uzice, centre of rebellion. ¶ Reinhard Heydrich, nazi chief of security police, named reich protector of Bohemia-Moravia.

28. Nazis arrested Czech Premier Gen. Alois Elias and declared state of emergency in six sections of Bohemia-Moravia. ¶ Strike of 17,000 C.I.O. steel workers at three big plants in Birmingham area ended when Gov. Dixon withdrew home guardsmen.

29. W. Averell Harriman, head of U.S. mission to Moscow, pledged fullest U.S. support to U.S.S.R. at opening

of Anglo-U.S.-Soviet parleys in soviet capital.

30. Prime Minister Churchill reported British gains in military strength but warned that Germany still held initiative in all military fields except air. ¶ Freedom of worship as well as right to propagandize against it guaranteed by constitution of U.S.S.R., as by the U.S. constitution, said President Roosevelt in press conference.

OCTOBER, 1941

1. Delayed dispatch from Reykjavik announced landing of new force of U.S. army units in Iceland under command of Maj. Gen. Charles H. Bonesteel. ¶ New U.S. excise tax of 10% on retail goods went into effect; many luxury products were hit by new levy. ¶ U.S. and Britain should police world for at least 100 years after defeat of axis to ensure peace enforcement, Sec'y of Navy Knox said in address before American Bar association. ¶ U.S. and

British missions agreed to fill all soviet needs for war supplies, at close of three-power parley in Moscow. ¶ Chinese military dispatches said Japanese armies had retreated in disorder from Changsha.

2. Intensive drive against Moscow along a 375-mi, front launched by German armies. ¶ German bombers blasted five English towns in first big raids over Britain after

beginning of Russian campaign.

- 3. German armies had broken backbone of Russian resistance, Hitler told German people. § British authorities called last-minute halt to scheduled exchange of some 3,000 German and British war prisoners. ¶ Australian Prime Minister Arthur W. Fadden's government fell after debate on budget; John Curtin, labourite, accepted commission to form new government. ¶ Charles A. Lindbergh told America First rally in Ft. Wayne that Pres. Roosevelt was leading U.S. along road which might involve suspension of congressional elections in 1942. ¶ Pres. Roosevelt revealed that he had been pressing U.S. representatives in Moscow to prod U.S.S.R. to permit freedom of religious worship. ¶ Six Jewish synagogues were blown up in Paris; Marshal Pétain commuted death sentence of Paul Colette, young Frenchman who shot Pierre Laval and Marcel Déat, to life imprisonment. ¶ Pope Pius XII denounced sterilization, racial marriage laws and "mania for divorce."
- 4. Soviet troops made 18-mi. advance in the Ukraine sector, Moscow reported. ¶ Norwegians warned by nazi Commissioner Josef Terboven to accept Quisling's "new order" or be annexed to reich.
- 6. New York Yankees beat Brooklyn Dodgers, four games to one, to win 1941 baseball world series.
- 7. German Field Marshal Fedor von Bock's forces drove to within 130 mi. of Moscow; Field Marshal Karl von Rundstedt's armies seized ports of Mariupol and Berdiansk on Sea of Azov. ¶ Finnish government rebuffed Britain's demand to cease war on U.S.S.R.
- 8. Recapture of Ichang in Hupeh province by Chinese admitted by Japs in Shanghai. ¶ Russians admitted loss of Orel.
- 9. Pres. Roosevelt asked congress for immediate authority to arm U.S. merchantmen. ¶ Arnulfo Arias, who banned arming of Panama merchant ships, was ousted as president of Panama; cabinet selected Ricardo Adolfo de la Guardia as his successor.
- 10. German panzer divisions reached point 105 mi. S. of Moscow. ¶ British War office disclosed that shock troops known as "commandos" were being drilled for "invasion manoeuvres."
- 11. U.S. naval vessel discovered and "disposed of" German radio station operating in Greenland, navy dep't announced.
- 12. Germans advanced in Vyazma sector; red army admitted that Germans had taken Bryansk.
- 13. German troops occupied Vyazma, 130 mi. W. of Moscow.
 - 14. Moshaisk and Kalinin areas reached by Germans.
- 15. Nazi armies captured Kalinin, 100 mi. N.W. of Moscow. ¶ George E. Browne, indicted president of Stage Employees and Motion Picture Operators unions, was replaced as 11th vice-president of A.F. of L. at latter's convention in Seattle.
- 16. Japanese Premier Fumimaro Konoye's cabinet resigned after ministers failed to agree on national policy.
 ¶ Rumanian troops captured Odessa after two-month siege; nazis reported capture of Kaluga.
- 17. U.S.S. "Kearny," 1,630-ton destroyer, was torpedoed and damaged near Greenland. ¶ U.S. navy ordered U.S. merchantmen in Asiatic waters to put into friendly ports.

- 18. Strong Russian counterattacks blocked nazi thrusts in Kalinin and Moshaisk sectors. ¶ Lt. Gen. Hideki Tojo formed new Japanese cabinet and took over portfolios of prime ministry, war and home ministries. ¶ Hundreds of Yugoslav rebels were executed in an effort to stamp out revolt of Chetniks, Serb patriots. ¶ Canada's decision to control wages and prices was announced by Prime Minister W. L. Mackenzie King.
- 19. U.S. merchant ship "Lehigh" sunk in South Atlantic by submarine. ¶ Germans captured port of Taganrog in Donetz basin.
- 20. Moscow diplomatic corps reached Kuibyshev (Samara), temporary headquarters for foreign envoys in soviet union. ¶ Sec'y of Treasury Morgenthau disclosed U.S. had advanced \$30,000,000 to soviet union against promise of gold delivery. ¶ Panama's new government revoked ban on arming merchant ships.
- 21. Nazis executed 50 French hostages in Nantes, France; 100 more were ordered slain Oct. 23. ¶ Russians declared all German drives on Moscow had been stopped; Berlin announced capture of Stalino, and occupation of Dagoe Island at mouth of Gulf of Finland. ¶ William Fox, former movie producer, was sentenced to year and day in federal penitentiary and fined \$3,000 on charge of conspiracy to obstruct justice.
- 22. Germans seized 100 more French hostages after slaying of nazi major in Bordeaux; 50 were shot Oct. 24. ¶ Rumania denounced Vienna pact in effort to regain part of Transylvania surrendered to Hungary in Aug. 1940. ¶ Gen. Robert E. Wood, acting chairman of America First committee, appealed to Pres. Roosevelt to submit question of war or peace to vote of congress. ¶ Zagreb newspaper disclosed that nazis had executed 200 "Jews and communists" as reprisal for attack on two German soldiers in Belgrade Oct. 17.
- 23. Georgi K. Zhukov, chief of soviet general staff, took over command of central zone operations following shake-up of red army command; Marshal Timoshenko was shifted to southern front while Marshals Budenny and Voroshilov were charged with formation of new Russian armies.
- 24. Arthur Starnes, parachutist, dropped 29,300 ft. before opening his 'chute in record free fall from plane over Chicago.
- 25. German troops captured Kharkov and launched new drive against Moscow.
- 28. Mussolini, in speech marking 20th year of fascism, boasted that "coalition of bolshevism and its European and American allies" would be shattered.
- 29. Charles Fahy was named U.S. solicitor general by Pres. Roosevelt. ¶ ASCAP music became available to NBC and CBS radio networks as organization of composers signed agreement with radio companies ending dispute over royalties that began Jan. 1, 1941.
- 30. 1,190-ton U.S. destroyer "Reuben James" was torpedoed and sunk while on convoy duty west of Iceland; 76 of crew missing.
- 31. German troops pierced outer defenses of Tula.
 ¶ Marshal Boris Shaposhnikov was renamed chief of staff of red army.

NOVEMBER, 1941

1. Reich formally charged U.S. with attacking Germany in naval incidents involving U.S. destroyers "Greer" and "Kearny." ¶ German troops advanced in Kalinin area; Russians admitted nazi spearheads had entered Tula.

2. Pres. Roosevelt placed entire coast guard under navy dep't. ¶ Germans captured Simferopol, Crimean capital.

3. Reich rejected U.S. request for compensation of \$2,967,092 for torpedoing of U.S. freighter "Robin Moor" in South Atlantic May 21, Sec'y Hull revealed.

4. Fiorello La Guardia was re-elected mayor of New York city. § British warships seized six vessels in Vichy convoy trying to run contraband for Germans in South Atlantic. § Nazi divisions captured Theodosia, Crimean port near Kerch.

5. Japanese gov't announced that veteran diplomat Saburo Kurusu was en route to Washington on mission to establish basis for peace in Pacific areas.

6. U.S. loan of \$1,000,000,000 in lend-lease aid to U.S.S.R. was arranged through exchange of letters between Roosevelt and Stalin, state dep't revealed. ¶ Soviet government announced appointment of Maxim Litvinov to succeed Constantine Oumansky as Russian ambassador to Washington. ¶ Premier Stalin urged creation of second front and forecast "inevitable doom" of Hitler in broadcast on 24th anniversary of October revolution. ¶ Nazi propaganda minister Goebbels warned Germans they would face "inferno" if reich lost war. ¶ George Browne and Willie Bioff, who won control of A.F. of L. stage union, were found guilty by federal court in New York city of violating anti-racketeering statute. ¶ U.S. cruiser seized "Odenwald," axis raider disguised as U.S. merchant ship, in Atlantic equatorial waters, navy announced.

7. After 11 days of bitter debate, U.S. senate voted 50 to 37 to amend neutrality act to permit arming of U.S. merchantmen and entrance of U.S. ships into war zones. ¶ Russians launched counter-offensive from Kalinin to Volokolamsk.

8. German warships would fire on U.S. vessels only it attacked, Adolf Hitler declared in speech marking 18th anniversary of Munich beerhall putsch.

10. Churchill pledged U.S. that Britain would declare war on Japan "within the hour" if Japan and U.S. should go to war.

11. Finland rejected U.S. request to stop fighting against U.S.S.R. ¶ Manuel Quezon was re-elected president of the Philippines by estimated 7-to-1 margin over his nearest opponent.

12. Churchill told house of commons battle of Atlantic was turning in Britain's favour.

13. House of representatives voted 212 to 194 to amend neutrality act. ¶ Counterattacking Russian troops made new gains in Tula sector; nazi forces reported capturing coast positions south of Kerch in Crimea.

14. "Ark Royal," 22,500-ton British aircraft carrier, was torpedoed and sunk by axis submarine about 25 mi. E. of Gibraltar. J U.S. marines were ordered by Pres. Roosevelt to leave garrisons in Shanghai, Peiping and Tientsin.

16. C.I.O. national executive board voted unanimously to back John L. Lewis and United Mine Workers' union in strike for union shop in captive coal pits.

17. Japanese Premier Hideki Tojo set as terms for peace in Pacific: hands off China, lifting of economic blockade against Japan and end of military encirclement. ¶ Pres. Roosevelt and Saburo Kurusu, special Japanese envoy, conferred on Pacific crisis. ¶ Germans claimed capture of Kerch, key city in Crimea. ¶ Hitler placed sonquered areas of U.S.S.R. under civil administration of Alfred Rosenberg, chief nazi ideologist. ¶ Pres. Roosevelt signed law repealing neutrality act.

18. British forces launched a surprise sea, air and land

offensive into Libya, advancing 50 mi. in first 24 hr. § C.I.O., in its fourth constitutional convention, unanimously endorsed foreign policy of Pres. Roosevelt. § Lt. Gen. Sir Alan Brooke was named to succeed Gen. Sir John G. Dill as chief of British imperial general staff; Lt. Gen. Bernard C. Paget was appointed commander in chief of home forces, the post vacated by Gen. Brooke. § Japan's special emissary Saburo Kurusu and Ambassador Kichisaburo Nomura asked Tokyo for further instructions after three-hour parley with Sec'y Hull. § Russians admitted situation was "grave" in Crimea as red army withdrew from Kerch.

20. British desert armies captured Rezegh, 10 mi. S. of besieged Tobruk. ¶ Gen. Maxime Weygand "retired" as Vichy proconsul in Africa; Gen. Alphonse Juin was named head of French armies in North Africa. ¶ U.S. halted all economic aid to French North Africa on grounds that Weygand was ousted on express demand of Hitler.

21. Sixth major offensive against Moscow in three weeks was halted at Volokolamsk and Tula.

22. Anzac troops captured Fort Capuzzo, Italian strong-hold in Libya. ¶ Berlin announced that German troops had captured Rostov. ¶ John L. Lewis called off strike in captive coal mines and accepted Pres. Roosevelt's proposal for arbitration of union shop issue.

23. Anzac forces recaptured Bardia on Libyan coast while British and nazi tank armies engaged in battle at Rezegh. ¶ Germany cut occupation cost levied against French by 100,000,000 francs daily. ¶ U.S. consulate in Saigon, French Indo-China wrecked by bomb; none were injured. ¶ OPM announced use of lead and tin foil for wrapping cigarettes, candy and similar products would be prohibited after March 15, 1942.

24. U.S. sent troops to Dutch Guiana under agreement reached with Netherlands government in London; Brazil agreed to co-operate in military measures to protect Dutch Guiana. ¶ U.S. would extend lend-lease aid to Free French movement, Gen. De Gaulle's delegation in Washington announced. ¶ British reported capture of Gambut in Libya. ¶ German forces reached point 31 mi. W. of Moscow. ¶ U.S. supreme court ruled as unconstitutional California anti-migrant law designed to check influx of "Okies" into that state.

25. British tank units in Libya recoiled under counter blows of Gen. Erwin Rommel's panzer divisions. ¶ Pres. Roosevelt appointed William C. Bullitt as his special representative in near east. ¶ 13 nations, including Finland, signed anti-comintern pact in Berlin.

26. Sec'y Hull submitted new proposals for readjustment of U.S.-Japanese relations to special envoys Kurusu and Nomura. ¶ German troops driving toward Stalinogorsk flanked Tula. ¶ Axis forces captured 5,000 British soldiers, including two generals, in Libyan desert war, Rome dispatches said.

27. Pres. Roosevelt and Sec'y Hull conferred with Japanese envoys Kurusu and Nomura amid reports that Nipponese were massing troops in Indo-China. ¶ Anzac troops joined forces with section of British garrison in Tobruk; New Zealanders recaptured Rezegh. ¶ Italian garrison in Gondar, last Italian outpost in Abyssinia, surrendered to British after seven and one-half months' siege.

28. Shanghai dispatches reported 70 troop transports were moving 30,000 Japanese troops southward. ¶ Pres. Manuel Quezon asserted Philippines were unprepared for war.

29. Russians recaptured Rostov, routing Col. Gen. Paul von Kleist's armies. ¶ Japanese Premier Hideki Tojo declared Anglo-American "exploitation" of Asiatic peoples

ments to 71

30. Japanese Foreign Minister Shigenori Togo rejected as "fantastic" U.S. proposals for settling far eastern crisis. ¶ A state of emergency was decreed in Singapore and new reinforcements of British and Indian troops reached Rangoon, Burma. ¶ Cairo dispatches said mechanized British patrols reached Gulf of Sidra after 300-mi. advance across Libyan desert.

DECEMBER, 1941

1. Pres. Roosevelt conferred with Adm. Stark and Sec'y Hull on Japanese crisis; Japanese Ambassador Nomura told press "there must be wise statesmanship to save the situation"; Tokyo decided to continue parleys after hearing report by Foreign Minister Togo. ¶ Marshal Pétain and Marshal Goering met in St. Florentin in nazi-occupied France. ¶ Compromise wage agreement arranged by Pres. Roosevelt's fact-finding board averted threatened nationwide railway strike of 1,200,000 workers.

2. Pres. Roosevelt asked Japan for explanation of movement of troops, planes and ships into French Indo-China. § British warship squadron, headed by battleship "Prince of Wales" and battle cruiser "Repulse," arrived at Singapore. § Prime Minister Churchill asked commons for authority to draft 3,000,000 more men into armed forces and to require women to join uniformed services. § Gen. Rommel's axis tank units seized Rezegh, Libya. § Russian forces in Donetz area pursued German units fleeing west along shore of Sea of Azov.

3. Pres. Roosevelt announced that he had authorized shipments of lend-lease supplies to Turkey.

4. House of commons passed British conscription bill

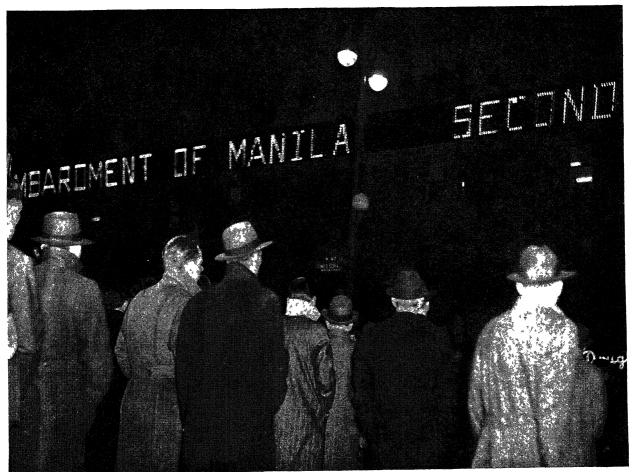
by vote of 326 to 10.

5. Japan told Pres. Roosevelt that reinforcements to Indo-China were only a precaution against Chinese troop movements along colony's northern border; official Tokyo spokesman said Washington parleys would continue and that both sides were sincere. ¶ Russian armies in Don basin swept 11 mi. past Taganrog.

6. Russians began counteroffensive along entire Moscow front. ¶ Pres. Roosevelt made personal peace appeal to Emperor Hirohito after hearing reports of heavy troop concentrations in Indo-China. ¶ Britain announced declaration of war on Finland, Hungary and Rumania.

7. Striking without warning, Japanese naval and air forces attacked and severely damaged U.S. ships in Pearl Harbor naval base, Hawaii, and also attacked strategic points in Philippines and Guam; Nipponese planes bombed Hong Kong and Singapore; Japanese troops landed in Malaya and moved on Thailand from French Indo-China; Japanese envoys were delivering Tokyo reply to U.S. note at time of attack on U.S. possessions; note rejected U.S. terms and said U.S. and Britain were "conspiring" against Japanese interests in Asia. ¶ Netherlands government in exile in London declared war on Japan; Canada and Costa Rica also declared war. ¶ Sec'y of Treasury Morgenthau impounded \$131,000,000 in Japanese investments in U.S. ¶ Russian armies broke German line on Moscow front at two points and destroyed two divisions.

News of the Japanese attack on Pearl Harbor, Manila and other points in the far east, flashing around the Times building at Times square, New York, Dec. 7, 1941



8. U.S. congress declared war on Japan; senate voted 82 to 0 and house voted 388 to 1; Representative Jeanette Rankin (Rep., Mont.) was lone dissenter. ¶ Prime Minister Churchill declared war on Japan in speech before house of commons; China declared war against Germany, Italy and Japan; Free French declared war against Japan, as did Honduras, San Salvador, Guatemala, Haiti and Dominican Republic. ¶ Thailand capitulated to Japan, 18 hours after first attack. ¶ Berlin spokesman admitted that winter had stopped German drive on Moscow and that capture of Russian capital was not expected before spring.

9. Pres. Roosevelt said U.S. had suffered serious reverses in Hawaii and told nation to expect long war. ¶ False air raid alarms upset New Yorkers. ¶ Japanese landed strong forces in Kota Bharu area of northern Malaya. ¶ Cuba and Nicaragua declared war on Japan. ¶ Russian armies recaptured Tikhvin on Leningrad front, reopening road

to Moscow.

10. Japanese torpedo planes sank 35,000-ton battleship "Prince of Wales," and 32,000-ton battle cruiser "Repulse" off Malaya. ¶ Japanese forces approached Kota Bharu, important Malayan air base 350 mi. north of Singapore; Japs landed strong forces on northern Luzon coast while air raiders launched heavy attacks on Cavite naval base near Manila. ¶ British armies in Libya completely freed Tobruk garrison and captured Gambut.

11. Germany and Italy declared war on U.S. and signed new pact with Japan to preclude separate peace; U.S. congress unanimously declared war on Germany and Italy. ¶ Mexico broke off relations with Germany and Italy; Cuba, Costa Rica, Nicaragua, Guatemala and Dominican Republic declared war on Germany and Italy.

12. U.S. forces battled Japanese invaders on three sides of Luzon island; Japanese strengthened their landing forces at Aparri and Vigan and landed troops off Zambales province and at Legaspi; small U.S. garrisons still held Wake and Midway islands. ¶ British withdrew from advanced positions in Hong Kong; Japanese said their troops had captured Kowloon; Chinese troops attacked all along Kwangtung front to relieve Japanese pressure on Hong Kong; withdrawals in Malaya near Thai border acknowledged by Britain. ¶ U.S. seized 83,000-ton liner "Normandie" and 13 other French ships.

13. U.S. armies recaptured Lingayen beach-head in Philippines. ¶ Premier Hideki Tojo cautioned Japan against over-optimism and warned of long, hard war. ¶ Allied destroyers in Mediterranean sank two Italian cruisers while a British submarine sank a third cruiser, British admiralty announced. ¶ U.S.S.R. would concentrate all efforts toward smashing Hitler's armies and did not envisage opening second front against Japan, Ambassador Maxim Litvinov told U.S. press. ¶ Red Army troops captured Volkhov on Leningrad front.

14. U.S. bombers sank four Japanese troopships and damaged five others off northern Luzon; U.S. marines on Wake island repulsed new Japanese attacks; Hong Kong rejected an ultimatum to surrender. ¶ Turkey told U.S. it would remain neutral in new conflict; Premier Eamon de Valera reaffirmed Eire's neutrality.

15. Sec'y Knox declared that 32,600-ton battleship "Arizona," three destroyers, a minelayer and target ship had been sunk in Japanese attack on Pearl Harbor, Dec. 7; he also said battleship "Oklahoma" was capsized but could be repaired. ¶ Pres. Roosevelt accused Emperor Hirohito of personal complicity in Japan's treacherous attack on

U.S. ¶ Japanese mechanized armies entered southern Kedah in Malaya. ¶ Moscow reported recapture of Klin, and announced new victories on all Russian fronts. ¶ Both houses of congress voted bill calling for \$10,077,077,005 in emergency war appropriations.

16. Filipino army division held Lingayen beach after 72-hour battle. ¶ British command in Hong Kong admitted evacuating mainland section on night of Dec. 11-12. ¶ Both houses of congress adopted bills granting Pres. Roosevelt virtually unlimited war powers. ¶ Pres. Roosevelt appointed Byron Price director of U.S. censorship. ¶ Russian troops recaptured Kalinin, Petrovsk and Volovo; Moscow said 9th German army corps had been destroyed.

17. U.S. commanders of army, navy and air forces in Hawaii were ousted; Rear Adm. Chester W. Nimitz was named commander-in-chief of Pacific fleet, relieving Adm. Husband E. Kimmel; Lt. Gen. Delos C. Emmons was assigned to command the Hawaiian department, relieving Lt. Gen. Walter C. Short. § British forces blew up oil wells and refineries in British Borneo as Japanese units made successful landing; Japanese troops in Malaya were reported in province of Wellesley. § Soviet armies between Lake Onega and Murmansk launched new drive on Finnish and German armies.

18. Tokyo communiqué said Japanese force had landed on island of Hong Kong; Netherlands and Australian forces occupied Portuguese section of Timor; British admitted Penang, island base off Malayan coast, had been cut off by Japanese. ¶ U.S. reached naval agreement with French authorities of Martinique. ¶ British armies broke axis lines west of El Gazala in Libya.

19. Portuguese Premier Salazar demanded evacuation of Timor Island by Allied force; British garrisons withdrew from Penang. ¶ House and senate voted bill to set draft age at 20 to 44 inclusive. ¶ British motorized forces occupied Derna airport in Libya. ¶ Russian troops recaptured Ruza and many other towns on central front. ¶ Spain announced "nonbelligerent" status in Pacific war.

20. Japanese troops landed at Davao on Mindanao Island, 600 mi. S. of Manila, and engaged U.S. forces.

§ British forces in Malaya organized new line south of Krian river, 300 mi. above Singapore.

§ Adm. Ernest J. King was named commander in chief of U.S. fleet; Rear Adm. Royal E. Ingersoll was named commander of Atlantic fleet.

§ Russian armies recaptured Volokolamsk.

§ British force occupied Derna as two other armies pursued axis units in Libya.

21. Adolf Hitler removed Field Marshal Walther von Brauchitsch as commander in chief of German army and assumed post himself.

22. Prime Minister Churchill made secret trip to Washington to confer with Pres. Roosevelt. ¶ U.S. and Filipino armies battled heavy Japanese force landed in Lingayen area from 80 Japanese transports carrying estimated 80,000 to 100,000 troops. ¶ Pres. Roosevelt signed amended selective service bill. ¶ Wake Island occupied by Japanese after 14-day resistance by garrison of 385 U.S. marines.

23. Pres. Roosevelt disclosed that he and British Prime Minister Churchill were conferring on plans for definite unity of action in Pacific; anti-axis war plans should be based upon defeating Germany not by anticipation of internal collapse but by external military blows, Churchill declared in dual press conference with Pres. Roosevelt at White House. ¶ Generalissimo Chiang Kai-shek named T. V. Soong Chinese foreign minister to replace Dr. Quo Tai-chi.

24. Free French naval force commanded by Vice-Admiral Emile Muselier occupied Vichy-governed islands of

St. Pierre and Miquelon. ¶ New Japanese landing near Atimonan on Luzon's east coast was announced by U.S. army headquarters in Philippines. ¶ Pope Pius XII, in annual Christmas message, broadcast five-point peace program and condemned anti-Christian movements and aggression. ¶ British troops in Libya took Barce and Benina, advancing to within 12 mi. of Bengasi.

25. British garrison at Hong Kong surrendered to Japanese after 16-day siege. ¶ 98% of St. Pierre's male population voted for Free French rule in plebiscite; U.S. state department assailed Free French occupation of St. Pierre and Miquelon and asked Canada what steps it would take to restore status quo. ¶ British armies captured Bengasi.

26. Gen. MacArthur declared Manila an "open city" to spare it from air or ground attack; Jap tank units struck heavily at Lamon bay; Nipponese spearhead reached Binangonan, 110 mi. N. of Manila; Air Chief Marshal Sir Robert Brooke-Popham was relieved of British far east command and replaced by Lt. Gen. Sir Henry Pownall. ¶ Addressing joint session of U.S. congress, British Prime Minister Churchill declared that anti-axis forces would probably launch victory drive in 1943. ¶ OPA Administrator Leon Henderson rationed new tires.

27. Japanese planes launched heavy air attack on "open city" of Manila; Nipponese troops steadily advanced on Manila from both north and south. ¶ Russian forces advanced on wide sweep along Oka river and captured Likhvin, rail juncture 30 mi. S. of Kaluga. ¶ British "commando" units staged raids on Vaagsoe and Maaloy islands off Norwegian coast, admiralty announced.

28. Pres. Roosevelt assured Philippines that their freedom would be redeemed, as U.S. navy promised "positive assistance" to hard-pressed islands. ¶ Japanese armies intensified drive about 45 mi. N. of Manila; Tokyo war office spokesman said Japanese armies refused to be bound by U.S. "arbitrary and unilateral" announcement of Manila as open city; Netherlands armies battled Japanese parachute troops in Dutch Sumatra near the Medan airport.

29. Gen. MacArthur shortened his lines as Japs continued drives on Manila bay; Nipponese forced spearhead through Ipoh, Malaya, and advanced to Kuantan on east coast.

30. Russian forces, covered by soviet Black sea fleet, captured Kerch and Theodosia; Russian armies on central front also recaptured Kaluga. ¶ \$50,000,000,000 yearly, half U.S. national income, would be expended for war production, Pres. Roosevelt announced. ¶ Churchill addressed Canadian parliament in Ottawa on Allied plans to defeat axis powers. ¶ Mohandas K. Gandhi quit leadership of All-India National congress party because it abandoned civil disobedience policy.

31. Hitler, in New Year's message, warned German people of hard fighting ahead in 1942.

JANUARY, 1942

1. Gen. MacArthur united his armies into single line girdling Manila; British acknowledged loss of Sarawak on north coast of Borneo; Nipponese submarines shelled Kauai, Maui and Hawaii, three islands in the Hawaii group. ¶ Representatives of 26 countries at war with axis signed in Washington a "Declaration by United Nations." ¶ British commandos staged successful raid on nazi-held Lofoten islands off northern Norway, London announced. ¶ Complete ban on retail sale of new passenger automobiles and light and heavy trucks was imposed by OPM. ¶ Marshal Pétain, in New Year's day speech, appealed

to reich to ease harsh occupation terms imposed on France.

2. Manila and Cavite naval base fell to Japanese as U.S.-Filipino forces withdrew to Bataan peninsula; Japanese landed more troops in Malaya as fighting in the west and central Malayan fronts grew heavier; Chinese force, sent at request of Allies, reached Burma. ¶ Russian armies ringed 150,000 nazis on Mozhaisk front and recaptured town of Maloyaroslavetz in that zone. ¶ South African

desert troops captured Bardia, Libya, releasing 1,000 British prisoners of war.

3. Pres. Roosevelt and Prime Minister Churchill announced creation of unified command in Southwest Pacific area with Gen. Wavell as supreme commander of all Allied forces in that area; Gen. Chiang Kai-shek accepted command of Allied land and air forces in Chinese theatre of war.

- 4. Gen. MacArthur consolidated his lines in Bataan, Pampanga and Zambales provinces; Japanese armies broke through Perak river defenses in Malaya; Japanese landing force pushed into British North Borneo, perilling remaining Allied positions on island. ¶ Russian armies captured Borowsk Mala in flanking movement south of Mozhaisk.
- 5. Japanese landed forces in Kuala Selangor, port city 240 mi. N. of Singapore.
- 6. Pres. Roosevelt, in annual message on state of union, told congress U.S. would spend more than half national income to prosecute war against axis. ¶ Japanese armies seized Kuantan airfield in eastern Malaya. ¶ Russians made two landings on Crimean peninsula, recapturing Yalta and Eupatoria in big drive to lift siege of Sevastopol.
- 7. A record budget of \$58,927,902,000, of which \$52,786,186,000 was slated for war expenses, was submitted to congress by Pres. Roosevelt; he recommended new taxes of at least \$9,000,000,000. ¶ Laurence A. Steinhardt was named U.S. ambassador to Turkey. ¶ Powerful drive carried Russian troops into Meshchovsk, 50 mi. S.W. of Kaluga. ¶ Tokyo dispatches said Japanese forces were withdrawing from Changsha after "accomplishing their objectives." ¶ Former King Carol of Rumania in Mexico City said he intended to proclaim himself regent of his former kingdom and thus assume leadership of a Rumanian government in exile.
- 8. German siege of Sevastopol had been lifted, according to Moscow broadcast. ¶ Japanese spearheads pierced British lines north of Kuala Lumpur on western Malaya front.
- 9. British military authorities warned Singapore would be gravely perilled unless reinforcements came quickly; Chinese armies pierced outer defenses of Canton, Chungking said. ¶ Dean James M. Landis of Harvard law school was made "executive" of Office of Civilian Defense by Pres. Roosevelt, to help Mayor La Guardia, OCD national director. ¶ Joe Louis, in 20th defense of world championship heavyweight title, knocked out Buddy Baer in first round.
- 10. Russian counterdrive near Murmansk compelled German general Dietl's armies to withdraw to new lines. ¶ Mutual Broadcasting system sued NBC and RCA, charging violation of Sherman antitrust act, and asked for \$10,275,000 in damages.
- 11. Japanese armies invaded Tarakan, Dutch oil island off Borneo; Netherlands forces battled parachutists and sea-borne troops in Minahassa on Celebes Island. ¶ Tokyo announced capture of Kuala Lumpur, key city in Malaya. ¶ Russian armies captured Lyudinovo, important rail junction on Rzhev-Bryansk line.

12. Soviet troops won control over mountain spur commanding entrance to Petsamo, Kuibyshev dispatches said. § William H. Davis was named head of new 12-man National War Labor board, which was given broad powers to settle labour disputes. § Dr. Slovodan Yovanovitch replaced Gen. Dusan Simovitch as premier of Yugoslav government in exile in London; Gen. Draja Mikhailovitch, leader of Serb guerrillas, was named war minister.

13. Dutch admitted fall of Tarakan Island to Japanese; British troops evacuated Port Swettenham, 40 mi. S.W. of Kuala Lumpur. ¶ Mozhaisk gap in nazi lines was widened as soviet units seized Gorokhovo, 8 mi. W. of Mozhaisk on Moscow-Smolensk road. ¶ Donald M. Nelson was named chairman of new War Production board by Pres. Roosevelt.

14. Gen. MacArthur's armies on Bataan peninsula hurled back two Japanese attacks, navy dep't announced; Adm. Thomas C. Hart had successfully evacuated entire U.S. Asiatic fleet from Cavite naval base after Manila's fall. ¶ U.S. blacklisted 1,800 companies in five remaining neutral countries of Europe doing business with axis.

15. U.S. Undersec'y of State Welles urged Latin-American countries to break all ties with axis at opening session of Inter-American conference of foreign ministers at Rio de Janeiro. ¶ Russian troops captured Selizharuva, 100 mi. W. of Kalinin, in swift drive to flank German forces in Staraya Russa. ¶ Mohandas K. Gandhi announced Pandit Jawaharlal Nehru would succeed him as leader of All-India Congress committee.

16. Japanese seized port of Malacca, 90 mi. N. of Singapore, and penetrated deep into Johore state: Nipponese armies launched third drive into Burma at Myitta, 15 mi. from Thai border. ¶ Sir Archibald Clark Kerr, British

ambassador to China, was appointed to succeed Sir Stafford Cripps as British ambassador to U.S.S.R.

17. Nipponese armies won foothold on south bank of Muar river, 90 mi. N. of Singapore. ¶ Prime Minister Churchill returned to London after lengthy visit with Pres. Roosevelt in Washington. ¶ More than 5,000 axis troops besieged in Halfaya pass in Libya surrendered to British.

18. Batu Pahat, 70 mi. N. of Singapore, captured by Japs. ¶ Burmese Prime Minister U Saw, suspected of complicity with Japanese, was detained by British authorities.

19. Nipponese troops captured Tavoy, Burma coastal port 235 mi. S.E. of Rangoon.

20. Russian armies recaptured Mozhaisk, key city in defense of Moscow, after 18-day battle. ¶ New daylight saving bill, designed to remain operative throughout war emergency, signed by Pres. Roosevelt; effective Feb. 9, 1942.

21. Japanese and Thai troops swept toward Lower Burma and won positions 45 mi. from Moulmein.

22. Gen. MacArthur shortened lines of American forces in Bataan peninsula; Dutch authorities set fire to Balik Papan oil fields in Borneo to thwart possible Japanese capture. ¶ Gen. Erwin Rommel launched surprise counterattack in Libya, driving British 10 mi. back, beyond Mersa el-Brega.

23. Russian armies captured 2,000 towns, including Kholm, in drive through the Valdai region 150 mi. S. of Leningrad. ¶ British armies retreated to within 60 mi. of Singapore and fell back on Burma front to positions 30 mi. E. of Moulmein. ¶ Japanese landed invasion

Death carts of Warsaw, used to haul away victims of Hitler's plan for exterminating the Jews of Europe, as affirmed in his speech of Jan. 30, 1942. This photo of the carts and one of their drivers was smugaled out of the Warsaw ahetto



- 24. Supreme Court Justice Robert's report on Pearl Harbor disaster said success of Japanese blitz was caused mainly by failure of Adm. Kimmel and Lt. Gen. Short to take adequate joint defense measures. ¶ Peru and Uruguay took lead among South American republics in breaking relations with axis powers.
- 25. U.S. warships sank 5 enemy transports in Japanese convoy lanes in Strait of Makassar between Borneo and Celebes. ¶ Australian armies battled Japanese on New Britain Island.
- 26. First American expeditionary force of World War II, several thousand strong, landed in Northern Ireland. § Bolivia and Paraguay severed diplomatic and economic relations with axis.
- 27. Between six and ten U.S. expeditionary forces were operating outside U.S., said Pres. Roosevelt. ¶ Mersing, on east Malayan coast 50 mi. above Singapore, captured by Japanese. ¶ British admiralty revealed that 31,000-ton battleship "Barham" was sunk Nov. 26, 1941, in Mediterranean.
- 28. British high command ordered evacuation of civilians from northern shore of Singapore Island as Japanese advanced to within 40 mi. of island fortress. ¶ Inter-American conference of American foreign ministers adjourned in Rio de Janeiro after 21 delegates signed final resolution calling for severance of all ties with axis; Pres. Vargas of Brazil broke off relations with axis. ¶ Brig. Gen. Patrick J. Hurley was named minister to New Zealand by Pres. Roosevelt.
- 29. Prime Minister Churchill won 464-to-1 vote of confidence in house of commons. ¶ Gen. Rommel's columns recaptured Bengasi, important Libyan port, as axis desert drive gathered momentum. ¶ Maj. Gen. Millard F. Harmon was named chief of U.S. army air staff; Brig. Gen. Carl Spaatz was assigned as chief of army air combat command. ¶ Ecuador and Peru signed agreement to end century-old boundary dispute; Ecuador also broke off diplomatic relations with axis.
- 30. Japanese armies pushed British back to within 18 mi. of Singapore. ¶ Official Eire statement charged that landing of U.S. troops in Northern Ireland "violated" Eire's neutrality and represented recognition of "Quisling" rule in Ulster. ¶ Adolf Hitler predicted eventual nazi victory and declared that his campaign against the Jews would continue. ¶ Pres. Roosevelt signed controversial price control bill but declared that expansion of farm prices to 110% of parity endangered price structure and might lead to inflation.
- 31. Japanese drove weary British imperial forces from Malaya mainland across Strait of Johore and laid siege to Singapore; British were also forced to evacuate strategic port of Moulmein, Burma, 92 mi. from Rangoon; Japanese struck with great force at Dutch island of Amboina, Indies naval base in Southwest Pacific. ¶ Marshal Timoshenko's armies captured Berestovoya, 115 mi. W. of German-held Taganrog in Don basin drive. ¶ U.S. Pacific fleet units raided Marshall and Gilbert Islands, destroying 16 Japanese ships, 38 planes and shore installations.

FEBRUARY, 1942

- 1. Japanese launched new drive to cross Salween river in Burma. ¶ Juan Antonio Ríos, Popular Front candidate, was elected president of Chile by majority of more than 55,000 votes. ¶ Vidkun Quisling was proclaimed premier of Norway by Reichcommissar Josef Terboven.
- 2. Gen. MacArthur's armies fought off Japanese attempt to encircle U.S. forces on Bataan peninsula.

- 3. 26 Japanese bombers attacked Dutch naval base of Surabaya in first aerial assault on Java, causing heavy damage.
- 4. German troops in Libya recaptured port of Derna. ¶ Lord Beaverbrook was named to newly created British cabinet post of minister of war production.
- 5. British admitted Japanese crossing of Salween river in Burma and capture of Paan by the enemy. ¶ German Afrika Korps advanced to within 55 mi. of British-held Tobruk in Libya. ¶ Mustafa Nahas Pasha formed new Egyptian cabinet.
- 6. Gen. MacArthur ignored broadcast plea of Emilio Aguinaldo, leader of Philippine insurrection in 1899, to surrender; Japanese troops occupied Samarinda, oil centre in Borneo.
 - 8. Japanese effected landings on Singapore Island.
- 9. Tenga aerodrome, only ten mi. from Singapore city, captured by Japanese, who also bombed Batavia, capital of Netherlands Indies, for first time. ¶ Adm. William H. Standley named by Pres. Roosevelt U.S. ambassador to soviet union.
- 10. Japanese troops reached points five mi. from centre of Singapore city; another Japanese army landed in southwestern Celebes near Makassar; Nipponese units in Burma captured Martaban.
- 11. U.S. state dep't announced that American troops had been sent to Aruba and Curação in Dutch West Indies to guard oil refineries there.
- 12. Two German battleships, "Scharnhorst" and "Gneisenau," and cruiser "Prinz Eugen" slipped out of Brest, France, and successfully ran gauntlet of British ships and aircraft in Strait of Dover. ¶ Bandjermasin, capital of Borneo, and Makassar, capital of Celebes, captured by Japanese.
- 13. Japanese armies cut off Singapore's water supply as small force of British imperial troops fell back to "last ditch" positions; Gen. MacArthur's beleaguered forces in Bataan weathered heavy Japanese plane assaults. ¶ Laura Ingalls, aviatrix, was convicted by federal court jury on charge that, as paid German agent, she failed to register with U.S. state dep't.
- 14. Japanese parachutists landed on Sumatra and attacked Palembang oil refineries.
- 15. Singapore surrendered unconditionally to Japanese; Lt. Gen. Arthur E. Percival of the British garrison and Lt. Gen. Tomoyuki Yamashita, Japanese commander in chief, signed surrender documents. ¶ 7,020,000 Americans between 20 and 45 registered in third U.S. draft. ¶ Dutch armies blew up oil refineries in Palembang area as Japanese landed troops along Musi river in Sumatra.
- 16. German U-boats shelled oil refinery on Aruba Island, Dutch West Indies, and sank 3 tankers with loss of 23 lives. ¶ Japanese captured Palembang, Sumatra oil centre; Nipponese armies in Burma occupied Thaton, forcing British back to Bilin river.
- 17. Japanese renamed Singapore "Shonan" (Light of the South).
- 18. Axis U-boats shelled Aruba and Port of Spain, Trinidad, sinking tanker and damaging two ships. ¶ Mohandas K. Gandhi and Chiang Kai-shek met in Calcutta for first time and conferred on critical far east situation.
- 19. Prime Minister Churchill reorganized war cabinet, naming Sir Stafford Cripps to post of lord privy seal; Capt. Oliver Lyttleton was made minister of state with general supervision over production. ¶ Daladier, Blum, Gamelin, La Chambre and Jacomet stood trial on French war guilt

charges as Riom trials opened. ¶ Japanese planes bombed Port Darwin in first raid on Australia proper; U.S. destroyer "Peary" sunk in harbour; Jap armies crossed Bilin river in Burma and threatened Pegu railway junction north of Rangoon. J Brig. Gen. Dwight D. Eisenhower was named chief of U.S. war plans division.

20. Japanese invaded island of Bali in drive to close in on Java from both Sumatran and Celebes bases; Jap armies also invaded Portuguese Timor, "in self-defense," but promised to withdraw after ousting British and Dutch. ¶ Mrs. Eleanor Roosevelt resigned as associate director of Office of Civilian Defense to end "political" attacks on

21. Premier Salazar of Portugal lodged "energetic protests" against the Japanese occupation of Portuguese

22. British cabinet reshuffled by Churchill, who dropped Capt. Margesson from war office and Col. Moore-Brabazon from aircraft production ministry; Sir James Grigg was named war sec'y. ¶ King George nominated Dr. William Temple, archbishop of York, to succeed Dr. Cosmo Gordon Lang, as archbishop of Canterbury; Dr. Cyril Forster Garbett, bishop of Winchester, was nominated as archbishop of York.

23. Pres. Roosevelt said U.S. would soon take offensive in war against axis but warned that more losses were to be expected before tide turned. I Refinery near Ellwood oil field on California coast, 12 mi. W. of Santa Barbara, shelled by Japanese submarine. ¶ Japanese overran Bali, capturing Den Pasar airfield. ¶ Russian troops occupied Dorogobuzh in drive to outflank nazis in Vyazma and Smolensk sectors.

24. U.S. naval task force attacked Japanese-held Wake Island, destroying enemy installations there.

26. Gen. MacArthur's armies advanced five miles in Bataan area in surprise drive against Japanese. ¶ Maj. Gen. Henry Gordon Bennett, commander of Australian imperial armies in Malaya, reached Batavia after fleeing Singapore in Chinese junk.

27. Allied and Japanese warships engaged in battle for control of Java seas; Allies on March 14 admitted loss of 12 ships, including U.S. aircraft tender "Langley" and cruiser "Houston," during engagement, which continued

until March 1.

28. Java invaded by Japanese, who ran gauntlet of United Nations warships to land in middle and western parts of island. ¶ Rear Adm. Husband Kimmel and Lt. Gen. Walter Short would face courts-martial for "dereliction of duty" at Pearl Harbor, U.S. navy and war dep'ts announced. ¶ Temporary wholesale price ceilings placed by Leon Henderson on 25 varieties of canned fruits and vegetables to prevent price increases and hoarding. ¶ U.S. destroyer "Jacob Jones" was sunk by axis U-boat off Cape May, N.J.; all but 11 of crew went down with ship.

MARCH, 1942

1. Japanese troops poured into Java from three beachheads and streamed toward principal objectives-Surabaya, Batavia and Bandung. J U.S. naval tanker "Pecos," carrying survivors of aircraft tender "Langley," was sunk by Japanese dive bombers in Southwest Pacific.

2. Gen. Wavell was transferred from command of Southwest Pacific to former post as commander in chief of India and Burma; command of United Nations forces in Java passed to three Netherlands chiefs: Lt. Gen. Hein ter Poorten of army, Vice-Adm. C. E. L. Helfrich of navy

and Maj. Gen. L. H. van Oyen of air force. ¶ Pres. Roosevelt streamlined army and put air force on equal footing with ground force; Lt. Gen. Henry H. Arnold was made commander of air forces, Lt. Gen. Leslie J. McNair commander of ground forces and Lt. Gen. Brehon B. Somervell commander of supply services.

3. R.A.F. bombers blasted Renault factories in Billancourt, France, in heavy air raids over industrial suburbs

of Paris.

4. Japanese armies won mastery of air over Java and hurled back United Nations forces in all sectors; British armies retreated beyond Sittang river in Burma. ¶ Marcus Island raided by U.S. naval forces.

- 5. Japanese troops occupied Batavia as United Nations defenses in Java collapsed. ¶ George Sylvester Viereck was convicted of concealing vital information when he registered as axis agent with state dep't. ¶ Russian armies on central front captured Yukhnov in Rzhev sector.
- 6. A German major and five U.S. citizens of German origin were convicted of espionage in federal court in New York city in first spy trial in U.S. since beginning of U.S. entry into World War II.
- 7. Japanese units crushed United Nations resistance in Bandung area. ¶ Free French forces captured axis outpost in Fezzan province in extreme southern area of Tripoli-
- 8. Japanese transports landed troops on Salamaua and Lae in New Guinea Island. ¶ Rangoon fell to Japanese armies pushing westward in Burma.
- 9. Adm. Ernest J. King succeeded Adm. Harold R. Stark as U.S. chief of naval operations and retained his post as commander in chief of U.S. fleet. I Gen. Tomoyuki Yamashita, conqueror of Malaya, was assigned to head Japanese armies opposing Gen. MacArthur's forces in Bataan, U.S. war dep't announced.
- 10. Japanese occupied Finschhafen, New Guinea port northeast of Lae. ¶ Lt. Gen. Joseph W. Stilwell of U.S. army was made chief of staff of United Nations armies in China theatre of operations. ¶ Nicholas von Kallay formed Hungarian cabinet.

15. Total destruction of Russia's "bolshevist hordes" by summer of 1942 was predicted by Adolf Hitler.

- 17. Gen. MacArthur, after leaving Philippines at behest of Pres. Roosevelt, reached Australia and assumed command of United Nations armies in Southwest Pacific; Maj. Gen. Jonathan M. Wainwright assumed command of U.S. and Filipino armies in Philippines. ¶ Third U.S. draft lottery held in Washington, D.C.
- 19. Japanese armies opened land drive across New Guinea jungles in push toward Port Moresby. ¶ Richard G. Casey, Australian minister to U.S., was made minister of state in British war cabinet to represent Britain in middle east.
- 20. Gen. MacArthur told cheering thousands in Melbourne that Pres. Roosevelt had ordered him to take offensive.
- 21. Pres. Roosevelt ordered Office of Defense Transportation to seize Toledo, Peoria & Western R.R. after road's president rejected appeal to arbitrate wage dispute.
- 22. Gen. Wainwright rejected Japanese ultimatum to surrender his armies on Bataan peninsula.
- 23. Japanese occupied Andaman Islands in Bay of Bengal.
- 25. U.S. forced Standard Oil Co. group and I. G. Farbenindustrie, German chemical trust, to release patents, royalty-free, for manufacture of synthetic rubber and other vital chemicals.
 - 26. "We shall win or we shall die," Gen. MacArthur

pledged in speech before Australian parliament. ¶ Brazilian authorities smashed axis spy ring, arresting more than 100 suspects in nation-wide roundup.

- 27. Chinese armies in Burma recaptured Toungoo airfield. ¶ Sir Stafford Cripps conferred with Mohandas K. Gandhi on proposals for Indian independence. ¶ Russian naval forces landed Red army units behind nazi lines in Murmansk area in move to thwart German drive on that arctic seaport. ¶ U.S. Senate rejected committee ruling calling for ouster of Sen. William Langer (Rep., N.D.) on charges of political corruption. ¶ Joe Louis knocked out Abe Simon in 6th round of scheduled 15-round bout for world's heavyweight boxing championship.
- 28. British commandos raided nazi submarine base at St. Nazaire, France. ¶ Japanese troops battled way into Toungoo after bitter hand-to-hand fighting with Chinese forces in Burma.
- 29. Sir Stafford Cripps revealed British plan to offer India complete dominion status after war in return for Indian co-operation in fight against axis.
- 30. Creation of Pacific war council announced by Pres. Roosevelt to plan joint war policy; member nations included U.S., Australia, New Zealand, China, Netherlands, Canada and Great Britain.
- 31. British armies in Prome area of Burma were cut off by Japanese force advancing up Irrawaddy valley. ¶ Gen. Sir Thomas Blamey was named commander of Australia's armies.

APRIL, 1942

- 1. Japanese forces in Bataan captured U.S.-Filipino outposts. ¶ Chinese units evacuated Toungoo in Burma as British armies withdrew 15 mi. in Prome area.
- 2. British forces abandoned Prome in Burma after violent battle. ¶ Rear Adm. Philippe-Marie Auboyneau was named commander of Free French naval forces, succeeding Adm. Emile Muselier, who resigned.
- 3. Carlton J. H. Hayes, history professor at Columbia university, was named U.S. ambassador to Spain, succeeding Alexander W. Weddell.
- 4. U.S. recognized Free French control over Cameroons and French Equatorial Africa. ¶ F.B.I. agents arrested William Dudley Pelley, pro-fascist leader and chief of "Silver Shirts."
- 5. British fighter planes and anti-aircraft guns shot down 27 of 75 Japanese planes that attacked Colombo and Trincomalee in their first raid on Ceylon. ¶ Japanese armies pierced Gen. Wainwright's lines on Bataan peninsula.
- 6. India suffered first air raid when Japanese planes bombed Vizagapatam and Cocanada on Bay of Bengal.

 ¶ Japanese drive in Bataan gained momentum and seriously threatened U.S. forces.
- 7. British armies in Burma fell back to new line 40 mi. above Prome. ¶ Russians succeeded in reopening a rail line to beleaguered Leningrad, soviet dispatches said.
- 8. Gen. George C. Marshall, U.S. army chief of staff, and Harry Hopkins arrived in London to discuss United Nations war problems. ¶ Gen. Yamashita hurled waves of Japanese troops against American lines on Bataan, compelling new withdrawal of U.S. and Filipino forces. ¶ Japanese forces occupied Lorengai, capital of Manus Island in Admiralty group. ¶ Egyptian gov't arrested Aly Maher Pasha, former premier, "for reasons relating to safety and security of state."
- 9. Japanese armies overran Bataan, encircling exhausted American and Filipino army; U.S. continued to hold Corregidor and other island forts in Manila bay.

- 10. 12,000 Japanese troops landed on Island of Cebu in Philippines. ¶ Japanese dive bombers sank 10,850-ton British aircraft carrier "Hermes" in Bay of Bengal. ¶ All-India Congress party and Moslem league rejected British proposals for Indian independence; Sir Stafford Cripps, British negotiator, charged attitude of India's leaders was "critical and unconstructive."
- 12. Pandit Nehru said India would not participate in Britain's war effort, but would attempt to organize own war effort on free and independent basis.
- 13. Prime Minister Churchill revealed that Lord Louis Mountbatten had been appointed chief of commando raiders of British army, navy and air forces.
- 14. Pierre Laval returned to power in Vichy gov't amid worsening relations between U.S. and Vichy. § British 1942-43 budget called for £4,500,000,000 in revenues and £5,286,000,000 in expenditures. § U.S. and Filipino armies in Cebu put up stiff resistance to invading Japanese troops; Nipponese armies occupied Migyaungye in drive to capture rich Yenangyaung oil fields in Burma.
- 16. Japanese troops landed on island of Panay in Philippines. ¶ All inhabitants of Malta, civilian and military, were decorated en masse with the George cross for heroism and bravery during daily axis air raids.
- 17. U.S. expressed disapproval of Laval regime in Vichy by recalling Ambassador William D. Leahy to Washington "for consultations." ¶ British forces destroyed rich Yenangyaung oil fields before evacuating city of Magwe.
- 18. Japanese mainland was bombed for first time when planes, identified in a Tokyo broadcast as U.S. bombers, attacked Tokyo, Yokohama, Kobe and Nagoya; U.S. withheld announcement of raid, led by Maj. James H. Doolittle (promoted to brigadier general April 23) until May 10. Pierre Laval formed new Vichy cabinet, assumed title of chief of government and took over foreign affairs, information and interior posts. ¶ War Manpower commission established by Pres. Roosevelt to assure mobilization and effective use of nation's manpower; Paul V. McNutt was named chairman. ¶ Japanese captured city of Cebu on Cebu Island, Philippines, U.S. war dep't announced. ¶ "Surcouf," world's largest submarine, under De Gaullist colours, was listed as lost by Free French headquarters in London.
- 20. Pres. Roosevelt ordered navy to seize and operate four plants of Brewster Aeronautical corporation in New York city on grounds that plants were poorly managed. ¶ Pierre Laval, chief of gov't in Vichy, told Frenchmen their only hope of salvation lay in reconciliation with Germany.
- 21. Immediate seizure of all patents owned or controlled by axis was ordered by Pres. Roosevelt.
- 22. British commandos raided Boulogne, withdrawing after two-hour foray.
- 23. Union of South Africa broke off diplomatic relations with Vichy.
- 24. R.A.F. bombers delivered one of war's heaviest aerial attacks to date on Rostock, Germany. ¶ Chinese armies in Burma recaptured rail terminus of Taunggyi; British and Chinese positions in Burma were perilled by 80-mi. Japanese advance toward both Mandalay and Lashio. ¶ Registration of all U.S. men between ages of 45 and 64 inclusive was started.
- 25. U.S. troops, with Free French consent, had landed on New Caledonia in move to aid in defense of strategic Pacific island, war dep't announced. ¶ Gen. Henri Honoré Giraud, commander of 8th French army in May 1940,



U.S. aviators who participated in Gen. James Doolittle's initial raid on Japan, April 18, 1942, are shown with Chinese after their bomber crashed near a tiny village in China

escaped from nazi prison camp; nazis put up 100,000-mark reward for his capture.

26. Hitler renewed his pledge to German people to destroy "bolshevist colossus" but did not say when. ¶ British air force extended night raids to Skoda arms works in Pilsen. ¶ Lt. Gen. Hugh A. Drum ordered immediate dimming of shore lights and control over axis aliens in eastern military area.

27. Pres. Roosevelt presented to congress sweeping program designed to check inflation, including proposals for \$25,000 individual income limit, stabilized wages, price ceilings, rationing of scarce commodities, reduction of farm prices to even parity and credit curtailment. ¶ Canadian gov't's request to use conscription if necessary was approved in national plebiscite. ¶ Gandhi expressed alarm over arrival of U.S. troops in India and urged India to train its own soldiers rather than rely on foreign troops. ¶ U.S. destroyer "Sturtevant" was sunk off Florida coast by underwater explosion, navy dep't said. ¶ WPB ordered 25% cut in coffee deliveries to wholesalers and roasters in order to conserve stocks.

28. OPA froze prices of all major items affecting living costs in drastic move to check inflation; stabilized rent limits were ordered in 301 areas designated as defense rental regions.

29. Lashio, Burmese terminus of Burma road, fell to Japanese troops. ¶ Times square in New York city was virtually blacked out as army ordered dimming of advertising signs and blackout of top stories of skyscrapers to eliminate night sky glow. ¶ R.A.F. bombers raided German naval bases at Kiel and Trondhjem; German fliers retaliated by bombing cathedral town of York.

30. Joseph Stalin asserted soviet union had no territorial ambitions in foreign countries, declaring sole Russian aim was to liberate its lands from "German fascist blackguards." ¶ Hitler and Mussolini conferred for seventh time, near Salzburg, and reached "unity of views and decisions"; conference took place April 29 and 30.

MAY, 1942

1. R.A.F. resumed large-scale raids over Germany and German-controlled areas, bombing railways and ports on nazi-held coast of continent. ¶ Mandalay fell to Japanese army in Burma.

2. Working committee of All-India Congress party adopted resolution urging Indians to meet invasion only through "nonviolent noncooperation." ¶ Japanese bombers and big guns subjected, Corregidor fortress to terrificattack. ¶ Extension of lend-lease aid to Iran and Iraq announced by Pres. Roosevelt.

3. Japanese armies in New Guinea launched new drive up dense Markham valley jungles.

5. British landed on Madagascar to seize French naval base of Diégo Suarez. ¶ Japanese forces landed on Corregidor in drive to crush defenders of Manila bay fortress. ¶ Japanese armies in Burma entered Yunnan province, China, in fast northward push.

6. Corregidor's starving garrison of 7,000 Filipino and U.S. troops and 3,000 civilians surrendered; Gen. Wainwright notified war dep't he was arranging capitulation terms. ¶ Bomb-battered U.S. cruiser "Marblehead," crippled by Japanese planes in Java sea action, had safely reached east coast port, navy announced.

7. Diégo Suarez, Madagascar, surrendered to British forces.

8. U.S. warships smashed Japanese fleet in big naval battle in Coral sea that started May 4; official accounts released June 12 said 15 Japanese warships, including one aircraft carrier and four cruisers, were sunk; U.S. losses were aircraft carrier "Lexington," destroyer "Sims" and a tanker. J London admitted Japanese forces had occupied Burma port of Akyab on Bay of Bengal; Japanese armies in Yunnan province made new gains, occupying Lungling, 50 mi. inside Chinese border.

10. Prime Minister Churchill warned Germans that Britons would retaliate with gas warfare on reich if German soldiers used poison gas on Russian front.

11. German forces launched long-heralded offensive in U.S.S.R. with strong drive against soviet forces in Kerch peninsula.

12. German armies pierced Russian lines in Kerch peninsula in drive toward southwestern shores of Sea of Azov.

13. Russian armies in Donets basin launched offensive against Kharkov in move to relieve German pressure on Kerch peninsula; soviet high command admitted Red army troops had fallen back to new positions in Kerch fighting. § Pope Pius appealed to world statesmen not to pass up opportunities for "an honest peace of justice and moderation."

14. Marshal Timoshenko's forces broke through strongly fortified German positions in Kharkov area; Moscow

admitted further withdrawals in Kerch sector. ¶ Adm. Georges Robert, French high commissioner for Martinique, agreed to co-operate with U.S. officials and disarm French warships there. ¶ Gas rationing along eastern seaboard went into effect; purchases were reduced to about three gallons per week for ordinary motorist. § Pres. Manuel Quezon established Washington headquarters for provisional Philippine commonwealth government-in-exile.

15. Remnants of British armies that survived gruelling Burma campaign eluded Japanese trap in Burma and

reached Indian frontier.

16. German armies captured town and harbour of Kerch. ¶ Pres. Roosevelt ordered release of Earl Browder, U.S. communist leader imprisoned for passport fraud, from Atlanta penitentiary to promote "national unity." ¶ Mrs. Oveta Culp Hobby was sworn in as director of the Women's Army Auxiliary corps, first U.S. women's army

18. Nazi troops, led by tanks and parachutists, launched heavy counterattacks in Kharkov sector. ¶ Rear Adm. Sir Henry Harwood succeeded Adm. Sir Andrew Browne Cunningham as commander of the British Mediterranean fleet.

- 19. German forces launched offensive in Izyum-Barvenkova sector below Kharkov in effort to divert Russian attack on latter city. I Brig. Gen. James H. Doolittle was awarded congressional medal of honour by Pres. Roosevelt for leading U.S. bomber squadron in attack on Tokyo April 18.
- 21. Russian armies halted Hitler's drive in Izyum-Barvenkova sector south of Kharkov and made new gains north of Ukraine industrial city.

23. A Moscow communiqué announced Russian troops had evacuated Kerch peninsula after savage fighting.

- 25. Gen. Joseph W. Stilwell said United Nations took "hell of a beating" in Burma, and declared Allies must retake Burma from Japanese.
- 26. Britain and U.S.S.R. signed 20-year mutual assistance treaty banning a separate peace with Germany. ¶ Nazi armies under Lt. Gen. Viktor von Schwedler regained offensive in Izyum-Barvenkova sector in sharp battles south of Kharkov. J Gen. Erwin Rommel hurled his Afrika Korps against British forces in Libya in new offensive against Allied desert armies.

27. Reinhard Heydrich, nazi protector for Bohemia and Moravia, was critically wounded by bomb hurled at his car on road from Prague to Berlin; he died June 4.

- 28. Rommel's Libyan armies stabbed sharply toward Tobruk in widening drive to flank British. ¶ Chinese forces abandoned Kinhwa, provisional capital of Chekiang province. ¶ Deportation of Harry Bridges ordered by Attorney General Biddle.
- 30. More than 1,000 British bombers dumped 3,000 tons of high explosives over Rhineland city of Cologne in one of war's heaviest single raids; nazi high command admitted damage was great.
- 31. German planes raided Canterbury, England, in reprisal raid for British aerial attack on Cologne.

JUNE, 1942

. 1. Air fleet of 1,036 British planes bombed Rhineland cities, dropping 3,000 tons of bombs on Essen. I Gen. Rommel's nazi panzers beat strategic retreat through two gaps in British mine fields between El Gazala and Bir Hacheim. ¶ Mexico formally declared war on Germany, Italy and

2. Prime Minister Churchill told house of commons that Rommel's plan for offensive in Libya had "gone completely awry." ¶ Pres. Roosevelt asked congress to recognize existence of state of war with Rumania, Bulgaria and Hungary.

- 3. Dutch Harbor, Alaska, was raided twice by Japanese planes. ¶ House of representatives unanimously passed three resolutions declaring war on Rumania, Hungary and Bulgaria.
- 4. British commandos raided French coast between Le Touquet and Boulogne. ¶ U. S. senate unanimously voted to declare war on Rumania, Bulgaria and Hungary. ¶ Adolf Hitler arrived in Finland to present Baron Carl Gustav Mannerheim his personal congratulations on latter's 75th birthday.

5. Pres. Roosevelt warned Japan that U.S. would retaliate in kind if Nipponese persisted in employing poison gas against China or any other United Nations ally.

- 6. U.S. warships and planes sank 4 Japanese aircraft carriers, 3 cruisers and 3 destroyers in Battle of Midway, June 4 to 6; 275 Japanese planes were destroyed and about 4,800 Japanese were killed or drowned; American losses were 307 casualties, destroyer "Hammann" and aircraft carrier "Yorktown," sinking of which was not announced until later.
- 9. Pres. Roosevelt and Prime Minister Churchill announced creation of combined production and resources board and combined food board to co-ordinate United Nations war production and food stocks.
- 10. Russian communiqué announced nazis had launched new offensive in Kharkov sector. ¶ Gestapo completely wiped out Czech village of Lidice, killing all men, sending all women to concentration camps and placing all children in "educational institutions"; this action was taken, Berlin said, because local population gave asylum to assassins of Reinhard Heydrich.
- 11. Pres. Roosevelt and Soviet Foreign Commissar Molotov signed lend-lease agreement. I German forces advanced in Kharkov area after series of fierce battles with defending Russian troops. I Free French garrison withdrew from Bir Hacheim, key position in Libya, after 16-day siege.
- 12. Japanese landings on Attu and Kiska islands in western tip of Aleutian chain announced by U.S. navy dep't.
- 13. Office of War Information established by President Roosevelt to exercise complete control over dissemination of official news and propaganda within U.S. and in other countries, except Latin America; Elmer Davis was named head of OWI.
- 14. Mexico and Philippine commonwealth formally joined United Nations in ceremonies at White House as Pres. Roosevelt appealed to nationals in axis countries to revolt against tyranny.
- 15. U.S. fliers damaged three cruisers, a destroyer and two smaller ships in heavy bombing attacks on Japanese forces in Aleutian islands.
- 16. Russians fought off nazi counterattacks and launched offensive on Kharkov front. ¶ R.A.F. and U.S. planes sank Italian cruiser and two destroyers attempting to attack United Nations convoys in Mediterranean, admiralty re-
- 18. Prime Minister Churchill arrived in Washington for new conferences with Pres. Roosevelt. ¶ Gestapo agents captured and killed assassins of Reinhard Heydrich in Prague church, German communiqué said.
- 20. Gen. Rommel's panzer units captured Bardia, Libyan
- 21. In swift surprise manoeuvre, Gen. Rommel's Afrika Korps seized Tobruk, captured 25,000 prisoners and chased tired British armies back toward Egyptian frontier. ¶ Arch-

bishop of Canterbury warned U.S. and Britain against exploiting their economic power in postwar period.

22. Second-front issue was high-lighted as Pres. Roose-velt and Prime Minister Churchill announced jointly that their objective was "earliest maximum concentration of Allied war power upon enemy"; Maxim Litvinov, soviet envoy to U.S., asked for immediate opening of second front.

23. Heavy German assaults compelled Russian retreat on Kharkov front. § Maj. Clement Attlee, British deputy prime minister, told commons that British fleet had lost one cruiser, four destroyers and two escort vessels while Italians lost one cruiser, two destroyers and one submarine, in Mediterranean convoy battle.

25. More than 1,000 R.A.F. bombers hammered German port of Bremen in 75-min. raid. ¶ Rommel's panzer divisions thrust 60 mi. into Egypt to engage British forces between Sidi Barrani and Mersa Matruh; Gen. Sir Claude J. E. Auchinleck succeeded Lt. Gen. Neil Methuen Ritchie as commander of British 8th army in Egypt. ¶ Russian armies abandoned Kupiansk as Germans developed major offensive southeast of Kharkov. ¶ U.S. established head-quarters in England for European theatre of operations under command of Maj. Gen. Dwight D. Eisenhower. ¶ Gen. George E. Stratemeyer was made chief of staff of U.S. army air force.

27. F.B.I. announced arrest of saboteurs who had been landed from submarines on Long Island with explosives and \$150,000 in cash. ¶ Pres. Roosevelt and Prime Minister Churchill asserted in joint statement that Allied military forces would initiate operations "to divert German strength from attack on Russia."

28. Germans opened new offensive from Kursk, 280 mi. south of Moscow, in attempted drive on Voronezh.

29. British troops evacuated Mersa Matruh on Egyptian coast in headlong retreat before Rommel's drive; nazi high command said 6,000 British were taken prisoner at Matruh.

30. About 3,000,000 youths between ages of 18 and 20 registered in U.S. for military service in fifth U.S. draft.

JULY, 1942

- 1. Sevastopol fell to nazis after 25 days of siege. ¶ British desert armies retreating to El Alamein, 70 mi. from Alexandria.
- 2. British counterattacks halted nazis in El Alamein sector; Prime Minister Churchill revealed Britain had lost 50,000 men and vast stores of supplies in Libya-Egypt battlefields, but house of commons approved his war policy by 475-to-25 vote of confidence.
- 3. U.S. army relaxed draft standards to enable induction of selectees with physical deformities for limited military service.
- 4. U.S. army air forces stationed in Britain bombed nazi military objectives in Netherlands in first U.S. air attacks on axis in Europe.
- 5. German armies made new gains in Kursk-Belgorod sector.
- 7. German armies claimed capture of Voronezh on Don river as nazi offensive swept toward Caucasus oil area. ¶ Maj. Gen. Carl A. Spaatz was named commander of U.S. air forces in Europe.
- 8. British planes dumped "block-busters" two-ton bombs—on shipyards in Wilhelmshaven.
- 9. British forces seized Mayotte, French island near Madagascar. ¶ Foreign Minister Shukru Saracoglu was appointed prime minister of Turkey.

- 10. Russian armies evacuated Rossosh as Hitler's tank forces rolled closer to the Don river. ¶ British 8th army advanced five miles along Egyptian coast railway and captured 1,500 axis prisoners.
- 11. Chetnik army of 250,000 men opened widespread guerrilla offensive against axis forces in Serbian mountains and at Italian-Croat frontier. ¶ Brig. Gen. Ira C. Eaker was named chief of U.S. bomber forces in European theatre.
- 12. All-India Congress party's working committee adopted Gandhi's plans for mass campaign to compel Britain to give India full independence.
- 13. Free French movement was renamed "Fighting French."
- 14. Maj. Gen. Mark W. Clark was named commander of U.S. ground forces in England.
- 15. Russians lost Boguchar in Don river bend but hurled back German assault at Voronezh. ¶ War Labor board, in 8-to-4 vote, ordered four "little steel" companies to award 44-cents-a-day wage increase to their 157,000 employees.
- 16. Washington asked Finland to shut all Finnish consulates in U.S. by Aug. 1. ¶ Lauchlin Currie, administrative assistant to Pres. Roosevelt, arrived in China to confer with Chiang Kai-shek.
- 17. Yugoslav guerrillas staged three daring raids against fascist garrisons near Trieste and battled Italian forces only six miles from Fiume.
 - 19. Evacuation of Voroshilovgrad admitted by Russians.
- 23. Sec'y of State Hull called for international agency to keep peace by force if necessary and for Allied surveillance over aggressor nations after war. ¶ Special federal grand jury indicted 28 persons, including Mrs. Elizabeth Dilling, George Sylvester Viereck, William Dudley Pelley, Gerald B. Winrod and William Griffin on charges of plotting to "cause mutiny" in nation's armed forces.
- 25. Russians admitted that nazis had established two bridgeheads over Don river near Tsimlyansk, 120 mi. from Rostov.
- 27. Russian armies evacuated Rostov and Novocher-
- 28. Allied patrols hurled back Japanese in mountain battle along Kokoda road on northeast coast of New Guinea.
- 30. Lauchlin Currie, personal representative of Pres. Roosevelt, assured Chinese that war operations in Europe would not prevent U.S. from increasing material aid for China
- 31. German panzer units captured Kushchevskaya in new drive south to Maikop oil fields in Caucasus; Russians admitted new retreat below Bataisk. ¶ U.S. supreme court upheld Pres. Roosevelt's power to order trial of eight nazi saboteurs before military tribunal instead of civil court. ¶ Mildred H. McAfee was named commanding officer of U.S. navy's women reserves (WAVES) with rank of lieutenant commander.

AUGUST, 1942

- 1. German forces captured Salsk on rail line linking Stalingrad and Krasnodar.
- 2. Warning that India's people might welcome Japanese invasion unless nation was granted full independence was sounded by Mohandas K. Gandhi.
- 4. William Green, A.F. of L. president, agreed to proposals made by Philip Murray, C.I.O. leader, to seek basis for merging organizations. ¶ House of commons passed bill transferring criminal jurisdiction over members of U.S. armed forces in England from British courts to U.S. military tribunals. ¶ Citing documents seized in raid on

All-India Congress party offices in Allahabad, British gov't charged that Mohandas K. Gandhi and majority of Congress working committee favoured "appeasement" with Japan. ¶ German armies took Voroshilovsk in drive south of Don river and reached banks of Kuban.

5. William Dudley Pelley, leader of disbanded fascist "Silver Shirts," was convicted on 11 counts of sedition by federal jury in Indianapolis; he was sentenced to 15 years

in prison Aug. 12.

- 6. Max Stephan, Detroit restaurant owner, was condemned to death for aiding nazi prisoner who escaped from Canada, in first U.S. treason conviction and sentence of execution since whisky rebellion in 1794. ¶ Pres. Roosevelt vetoed synthetic rubber bill and established own factfinding committee headed by Bernard M. Baruch to probe rubber situation. ¶ Germans captured Tikhoretsk, important rail junction 90 mi. below Don river and cut Baku-Black sea railway south of Voroshilovsk.
- 7. U.S. naval and marine forces launched heavy offensive against Japanese positions at Tulagi and Guadalcanal in Solomon Islands.
- 8. Six of eight nazi saboteurs were executed in District of Columbia jail; other two received sentences of life and 30 years respectively.
- 9. British government arrested Gandhi and 200 nationalist leaders after All-India Congress party approved resolution authorizing civil disobedience campaign; British authorities outlawed Congress party; rioting flared throughout India.
- 10. Civil disobedience rioting in India took 48-hr. toll of 18 persons killed and 209 wounded.
- 11. Three U.S. cruisers sunk with Australian cruiser by Japs after two-day naval battle off Savo Island.
- 12. U.S. marines consolidated their positions on three islands in Solomon group under protecting barrage of naval guns and bombs, U.S. navy communiqué said.
- 15. Germans launched offensive against Stalingrad with all-out attacks against Russian lines on Kletskaya and Kotelnikovski fronts.
- 16. Russian armies completely destroyed Maikop before evacuating this Caucasus oil city. I Mohammed Ali Jinnah, president of All-India Moslem league, cautioned Britain he would end "co-operation" if Moslem interests were sacrificed in any compromise with All-India Congress party.
- 17. U.S. marine force raided Makin Island in Gilbert group. ¶ Brig. Gen. Ira C. Eaker, chief of U.S. army bomber command, led Flying Fortress raid on occupied France in first all-U.S. aerial attack against nazi-held territory. ¶ Prime Minister Churchill and Premier Stalin completed four-day parley at Moscow in "atmosphere of cordiality and complete sincerity," soviet communiqué announced.
- 18. Gen. Sir Harold R. L. G. Alexander supplanted Gen. Sir Claude J. E. Auchinleck as commander of British imperial forces in middle east; Lt. Gen. B. L. Montgomery was named commander of the British 8th army in Egypt.
- 19. Canadian and British commandos, assisted by several units of U.S. "Rangers," staged nine-hour raid on French coast at Dieppe. ¶ German forces captured Krasnodar in drive toward Black seaport of Novorossiysk. ¶ British lost aircraft carrier "Eagle," cruiser "Manchester," anti-aircraft cruiser "Cairo" and destroyer "Foresight" as axis planes and ships hammered convoy en route to Malta. ¶ Chinese armies recaptured port of Wenchow.
- 21. United Nations would avenge execution of hostages and other "barbaric crimes" committed by axis in occupied Europe, Pres. Roosevelt declared. ¶ Gerhard Wilhelm Kunze, former head of German-American bund, re-

ceived 15-year sentence for conspiracy against the U.S.

22. Brazil declared war against Germany and Italy but not against Japan.

- 24. Siege of Stalingrad began; German tank forces paced a 50-mi. nazi advance to gates of Groznyi oil fields in
- 26. Japanese landed troops in Milne bay, 240 mi. E. of Port Moresby. ¶ Russian armies cut 30-mi. swath in German lines on Rzhev front after 16-day offensive that was launched on Aug. 11.
- 27. Gen. Georgi Zhukov was appointed Russian first vice-commissar for defense. ¶ U.S.S. "Iowa," 45,000-ton battleship, launched at Brooklyn navy yard.
- 28. Pres. Roosevelt hinted in press interview that U.S. would rehabilitate cultural monuments of Spain and spur tourist trade to that country if it remained neutral during
- 29. American Red Cross revealed that Japan had refused safe conduct for passage of mercy ship with supplies for U.S. war prisoners. ¶ Chinese forces recaptured Chuhsien, stormed into Lishui and seized two greatest airports in eastern China.
- 30. Japanese troops in Milne bay area of New Guinea were hurled back into sea by Australian forces, United Nations' communiqué declared. ¶ Chinese stormed suburbs of Nanchang, major Japanese base in Kiangsi province, and recaptured Lungyu in Chekiang province.

SEPTEMBER, 1942

- 1. Resignation of Foreign Minister Shigenori Togo from Japanese cabinet was linked to reports of Nipponese preparations for attack on Siberia. ¶ Japanese jungle troops battled way over Owen Stanley mountains to engage Australian forces at Kokoda.
- 2. Herbert Karl Friedrich Bahr, convicted as nazi spy, was given 30-year sentence by federal court in Newark, N.J. ¶ F.B.I. investigation resulted in sweeping exoneration of 2,049 of 2,095 federal employees who were charged by Dies committee of association with subversive and "un-American" activities.
- 3. Gen. Francisco Franco ousted Ramón Serrano Suñer as Spanish foreign minister in sweeping cabinet shakeup; Gen. Francisco Gomez de Jordana succeeded him.
- 4. Russian planes bombed Budapest, subjecting Hungarian capital to its first air raid of World War II.
- 7. Pres. Roosevelt told congress to enact curbs on wages and prices, declaring that he would put program into effect himself if congress failed to do so by Oct. 1.
- 8. Washington rejected Vichy's protest against raids of U.S. planes in German-held France.
- 9. Smashing German frontal assault compelled Russians to withdraw from two more villages west of Stalingrad. ¶ Edouard Herriot and Jules Jeanneney, former leaders of French parliament, warned Marshal Pétain and Chief of Gov't Laval that Frenchmen would not follow them in war against Allies. ¶ Japanese forces established new lines only 44 mi. from Allied base at Port Moresby in New
- 10. Compromise on Indian freedom demands barred by Winston Churchill, who declared that Cripps plan represented "settled policy" of Britain.
- 11. Soviets admitted loss of Novorossisk, Black sea naval
- 12. New Japanese landings in Solomons reported by **U.S.** navy communiqué.
 - 15. U.S. marines repulsed violent attempts by Japanese

troops to land on Guadalcanal Island. ¶ William M. Jeffers, railway president, was named U.S. rubber administrator

- 16. Russian civilians fought side by side with Red army to save Stalingrad as nazi shock troops battered northwest outskirts of city.
- 17. Charles E. Wilson, president of General Electric Company, was named vice-chairman of WPB.
- 18. Fresh Red army troops from Siberia helped Russians beat back three nazi shock forces that had penetrated into streets of Stalingrad. ¶ Nazis in Paris executed 116 Frenchmen who were described as "communist terrorists," a London report said.
- 23. Tananarive, capital of Madagascar, captured by British after two-week drive. ¶ Joseph Stalin received Wendell L. Willkie, Pres. Roosevelt's emissary, for two-hour conference in Kremlin.
- 25. More than 1,500 German dead littered Stalingrad streets after Russian troops regained important position within embattled city.
- 26. Wendell L. Willkie urged second front in Europe at earliest possible moment, in speech in Moscow, warning that "next summer may be too late."
- 27. Russians lost ground to Germans in one sector of Stalingrad, but drove Germans from buildings in house-to-house battles in another.
- 29. Australian forces slashed through Japanese lines in Owen Stanley Mountains in first major drive against foe since Japanese landings in Buna, N.G.
- 30. Adolf Hitler assured reich his armies would capture Stalingrad and said nazi armies were prepared for second front.

OCTOBER, 1942

- 1. Pres. Roosevelt returned from secret two-week tour of country's war production centres and revealed war output had reached 95% of his objectives. ¶ Nazi army of 300,000 made new advances into northwest outskirts of Stalingrad but lost ground in populated locality south of besieged Russian city.
- 2. Anti-inflation bill, providing stabilization of farm prices and industrial wages, signed by Pres. Roosevelt three hours after congress put finishing touches on program. ¶ Vichy authorities decided to conscript French labourers to meet insistent nazi demands for 150,000 skilled workers in reich war plants.
- 3. Associate Justice James F. Byrnes of U.S. supreme court was named director of economic stabilization with sweeping authority to control U.S. civilian purchasing power. ¶ U.S. army forces, supported by naval units, occupied Andreanof Islands, 125 mi. from Japanese-held Kiska base. ¶ Premier Stalin, in letter to American newsman in Moscow, declared Allied aid to Russia was inadequate and not commensurate with soviet contribution in war.
- 4. Marshal Goering told Berlin audience that German people would be fed during forthcoming winter at expense, if necessary, of German-occupied nations.
- 5. Japanese landed "small reinforcements" on Guadalcanal under cover of darkness, U.S. navy disclosed. ¶ Australian troops occupied village of Kagi in New Guinea mountains and cleaned up Japanese troops in region. ¶ OPA announced over-all rent ceiling, covering whole nation, would go into effect Dec. 5. ¶ St. Louis Cardinals baseball team defeated New York Yankees, 4 games to 1, in 1942 world series.
 - 7. Attu and Agattu islands in Aleutian chain apparently

- abandoned by Japanese, said U.S. navy communiqué. ¶ In Chungking, Willkie urged all-out "global" offensive and greater aid for U.S.S.R. and China. ¶ United Mine Workers of America voted to withdraw from C.I.O.
- 8. Nazi high command abandoned attempt to storm Stalingrad and announced plan to batter city with heavy artillery. ¶ WPB ordered gold mines to close in order to release manpower for mining tasks of more importance to war effort. ¶ Yugoslav guerrillas opposing rule of Gen. Draja Mikhailovitch had been killed in "spontaneous" uprising of people, according to Washington reports.
- 9. U.S. and Britain announced they were planning to relinquish their respective territorial rights in China. § Victory tax of 5% on all annual incomes of more than \$624 was voted in U.S. senate. § Ethiopia joined United Nations; Haile Selassie promised help in war against axis.
- 10. Soviet decree abolished political commissars in Russian army, returning full military control to Red army officers.
- 12. Three Japanese cruisers and three destroyers were sunk by U.S. task force in sea battle during night of Oct. 11-12 off Cape Esperance in Solomons; U.S. lost one destroyer. ¶ Atty. Gen. Francis Biddle announced that more than 600,000 Italian citizens living in U.S. would no longer be regarded as enemy aliens. ¶ Chicago court dismissed gov't's suit against Petrillo ban on recorded music for radio and juke boxes. ¶ William M. Jeffers, rubber administrator, defied senators who assailed plan to use rayon in rubber production.
- 15. U.S.S.R. bluntly demanded immediate trial and punishment of captured axis leaders and specifically cited Rudolf Hess. ¶ R.A.F. squadrons at Malta shot down 94 axis planes in five days of violent air duels.
- 17. Arrival of U.S. troops in Liberia was reported in dispatch from Monrovia.
- 20. \$9,000,000,000 tax bill was sent by congress to Pres. Roosevelt for signature. ¶ Chilean cabinet resigned following crisis caused by U.S. Undersec'y of State Welles's assertion that axis spies were operating in Chile.
- 21. Mitchell F. Hepburn resigned as premier of Ontario and was succeeded by Atty. Gen. Gordon Conant.
- 23. Offensive against axis forces in Egypt was launched by British 8th army under Lt. Gen. B. L. Montgomery.
 ¶ Mrs. Eleanor Roosevelt reached London and was greeted by King George VI and Queen Elizabeth.
- 24. Milan was raided by British bombers as R.A.F. synchronized attacks on Italian ports and industrial centres with British offensive in Egypt. ¶ Vice-Admiral William F. Halsey, Jr., replaced Vice-Admiral Robert Lee Ghormley as commander of U.S. naval operations in Solomon Islands area.
- 26. U.S. aircraft carrier "Wasp" had been sunk by Japanese submarine, navy disclosed; communiqué also announced that another aircraft carrier, later revealed as "Hornet," and destroyer "Porter" were lost in sea battle near Santa Cruz Islands in South Pacific; in latter action on the night of Oct. 25–26, U.S. fleet sank two destroyers and damaged two carriers, two battleships, four cruisers and destroyers. ¶ British 8th army moved forward on El Alamein front in Egypt and captured approximately 1,450 axis prisoners.
- 28. Germans launched flank drive against Russians at Nalchik, in move against oil city of Ordzhonikidze in Caucasus foothills.
- 30. Japanese fleet withdrew from Solomons, leaving Americans in full possession of their lines, Sec'y of Navy Knox revealed, but warned that only "first round" had been fought.

NOVEMBER, 1942

- 2. Allied ground forces recaptured Kokoda and pursued retreating Japanese along New Guinea mountain trail leading to Buna. ¶ Russians admitted nazi forces had pushed beyond Caucasus town of Nalchik.
- 3. Republicans won decisive gains throughout nation in congressional, gubernatorial, state and municipal elections.
- 5. Madagascar surrendered to British after six months of hostilities.
- 6. Treasury amended its \$25,000 salary limit to exempt salaries payable under 1942 contracts.
- 7. British 8th army chased Rommel's troops 240 mi. westward to Libyan frontier, capturing 20,000 prisoners. ¶ Joseph W. Martin, Jr., announced he would resign as chairman of Republican National committee to devote more time to congressional duties.
- 8. Large U.S. armies led by Lt. Gen. Dwight D. Eisenhower landed on Mediterranean and Atlantic coasts of French North Africa; Algiers surrendered with little resistance; Allied bombers scored hits on French battleship "Jean Bart" and four submarines in Casablanca harbour. ¶ Pres. Roosevelt assured French, Portuguese and Spanish that Allies had no desire for their territories. ¶ Adolf Hitler, addressing nazis in Munich, said reich would strike counterblow against Americans in Africa in due time.
- 9. U.S. forces surrounded Oran and captured three of four airfields in vicinity; France and U.S. formally severed diplomatic relations; Roosevelt asked Sidí Moncef Pasha, bey of Tunis, to permit passage of U.S. troops across Tunisia.
- 10. Allied headquarters in London revealed that Adm. Darlan was in U.S. custody in Algiers and was being "entertained" by an American general "with respect and dignity due an officer of his rank." ¶ Oran fell to U.S. forces while other troops entered outskirts of Casablanca.
- 11. Adolf Hitler declared the Franco-German armistice of June 1940 at an end as nazi troops marched into unoccupied zone while Italian forces advanced west of Nice and landed in Corsica. ¶ Casablanca surrendered to U.S. troops; Adm. Darlan ordered all French forces in North Africa to cease firing.
- 12. British 1st army headed by Lt. Gen. K. A. N. Anderson joined U.S. troops in eastern Algeria and started drive toward Tunisian border. ¶ U.S. senate approved bill for drafting 18- and 19-year-old youths in army and sent measure to White House for signature.
- 13. British 8th army occupied Tobruk and continued advance into Cyrenaica. ¶ Joseph Stalin, in letter to U.S. newsman, asserted that Anglo-American operations in Africa had turned tide of war in Europe and opened way for early collapse of axis.
- 14. Eddie Rickenbacker and five occupants of army bomber, missing in Pacific since Oct. 21, were rescued by U.S. flying boat, navy announcement revealed.
- 15. Major naval victory off Guadalcanal scored by U.S. fleet over Japs, who lost 28 ships sunk—including battle-ship, 8 cruisers, 6 destroyers, 12 transports—and 10 ships damaged, against U.S. losses of 2 cruisers and 7 destroyers; battle was fought Nov. 13–15. ¶ Adm. Darlan proclaimed protectorate over all French North Africa and named Gen. Giraud commander in chief of all French land, sea and air forces there.
- 16. Fighting French in London criticized U.S. deal with Adm. Darlan, declaring that they could not accept establishment of a "Vichy regime in Africa."
- 17. U.S. political arrangements with Adm. Darlan in French North Africa were only "temporary" expedients,



Contingent of U.S. infantry marching through Oran. They were part of the large Anglo-American invasion force which landed in North Africa on Nov. 8, 1942. Soldiers were tiny American flags on their helmets to identify them to the people of Oran

justified by military considerations, said Pres. Roosevelt. § British 8th army occupied port of Derna in Libya and pressed westward toward Bengasi.

- 18. British and U.S. parachute troops landed deep in Tunisia in manoeuvre to seize axis airfields; London reports said that Fighting French column of 10,000 men based in Lake Chad area was moving northward toward Libya. ¶ Marshal Pétain gave Pierre Laval dictatorial powers, authorizing the Vichy chief of gov't to make laws and decrees.
 - 20. Laval violently attacked Britain and U.S. in broad-

cast, proclaimed confidence in eventual axis victory.

21. Abandoned equipment littered streets of Bengasi as British marched into Libyan port city. ¶ Adm. Robert withdrew French West Indies and French Guiana from Vichy influence and reached an agreement with U.S. state dep't. ¶ 1,600-mile Alaska international highway, linking U.S., Canada and Alaska, was officially opened.

22. Russians opened offensive in Stalingrad area, capturing Kalach on Don river, advancing 40 mi. around Stalingrad's flanks and slaying more than 15,000 nazis. § Sir Stafford Cripps left British war cabinet post as lord privy seal to become minister of aircraft production.

23. Dakar came under Allied control as Gov. Gen. Pierre Boisson of French West Africa decided to submit to leadership of Adm. Darlan. ¶ Russian troops occupied Serafimovich and Chernyshevsk in Don river bend.

24. Three German-Americans who helped Herbert Hans Haupt, executed nazi saboteur, were sentenced to death for treason by federal court in Chicago.

25. Wendell Willkie, speaking at Toronto, criticized by inference U.S.-Darlan arrangement, warning that "moral losses of expediency" always outweigh temporary gains.

27. French scuttled most of their fleet in Toulon harbour as Germans moved into naval base city.

28. Russians routed 5 divisions, captured more than 500 populated places and killed 10,000 Germans in surprise offensive in Velikie Luki zone near Latvian frontier, Moscow dispatches said.

29. Prime Minister Churchill warned Italian people, in radio broadcast, to oust their leaders or suffer prolonged air attack on their cities. ¶ Coffee rationing went into effect throughout U.S. on basis of 1 lb. every 5 weeks for persons more than 15.

DECEMBER, 1942

- 1. U.S. naval squadrons repulsed new Japanese attempt to land on Guadalcanal, sinking 6 warships and 3 merchantmen and killing estimated 5,000 Japanese troops; 1 U.S. cruiser was lost and "other vessels" damaged. ¶ Nation-wide gasoline rationing, affecting 27,000,000 U.S. motorcars and 5,000,000 motor-buses and trucks, went into effect.
- 2. Mussolini assured his people that axis victory was certain, but urged civilian noncombatants to evacuate industrial cities.
- 4. Tébourba, Tunisia, recaptured by axis armies, which also penetrated Djedeida. ¶ WPA was ordered abolished by Pres. Roosevelt.
- 5. In sweeping move to solve manpower problem, Pres. Roosevelt (1) suspended army induction of all men over 38, (2) halted voluntary enlistments of all men between 18 and 38, (3) made Paul V. McNutt virtual dictator over U.S. manpower, (4) put selective service under McNutt's control, (5) gave him exclusive charge of training workers for war industries. ¶ Facts of Pearl Harbor attack Dec. 7, 1941, were disclosed by navy; 5 battleships, 3 destroyers, 1 minelayer and 1 target ship were sunk or severely damaged; 3 battleships, 3 cruisers, 1 seaplane tender and 1 repair ship were damaged but quickly repaired; 2,343 in the three armed services were killed and 960 missing.
- 6. Sec'y of Agriculture Wickard was named food administrator by Pres. Roosevelt. ¶ Creation of postwar Netherlands "commonwealth," in which Netherlands, Netherlands Indies, Curação and Surinam would have internal autonomy, was forecast by Queen Wilhelmina in radio broadcast.

- 7. Harrison E. Spangler was unanimously elected chairman of Republican National committee.
- 8. Gen. Franco told Spain world's choice was between communism or fascism and indicated he favoured latter.
- 10. Nazi broadcast revealed that Hitler had revamped German high command and made Gen. Kurt Zeitzler chief of German general staff.
- 11. Allied capture of Gona on northeast shores of New Guinea was announced by United Nations headquarters in Australia.
- 12. Only 4 of 4,000 U.S. soldiers were lost when 21,936-ton "President Coolidge," converted troopship, struck mine and sank in South Pacific, navy revealed.
- 13. Anton Mussert, Dutch nazi chief, was made "leader of the Netherlands people" by Adolf Hitler.
- 14. Pierre Laval vowed to crush ruthlessly everything in his path that would prevent him from "saving France." ¶ Madagascar was formally handed over to Fighting French administration by British government.
- 15. Capture of Buna village, New Guinea, by Australian and U.S. troops was announced by Allied headquarters.
- 17. Leon Henderson submitted his resignation as OPA administrator. ¶ Adm. Darlan announced that French warships at Alexandria, Dakar and at North African ports would join Allies.
- 19. British offensive in Burma had gained 40 mi. in first few days of drive, New Delhi communiqué revealed. ¶ Hitler held two-day conference with Count Ciano and Pierre Laval on axis strategy. ¶ Rommel's Afrika Korps retreated to positions 135 mi. west of El Agheila.

21. Nevada divorces were ruled valid in all states by U.S. supreme court decision.

24. Adm. Darlan was assassinated in Algiers; his slayer, young unidentified Frenchman, was executed Dec. 26; act was termed "first-degree murder" by Pres. Roosevelt. ¶ Pope Pius XII denounced Marxian socialism and "godless" totalitarianism and appealed for new world with freedom of race, religion and political opinion. ¶ Fourth major offensive was opened in Caucasus, where Russians reconquered positions in Nalchik area.

27. Gen. Henri Honoré Giraud was selected to succeed Darlan as high commissioner of French Africa.

29. Kotelnikovski was captured by Russian armies, sovict communiqué said. ¶ French Somaliland joined United Nations under aegis of De Gaulle's Fighting French.

30. Gen. Giraud announced that 12 persons had been arrested for plotting death of himself and Robert D. Murphy, U.S. minister in North Africa.

31. Chinese mission in Washington prepared to return home; recall was laid to Chiang Kai-shek's dissatisfaction with the quantity of U.S. aid sent to China.

JANUARY, 1943

- 1. 22 axis divisions were trapped in Stalingrad area where Russians forged great steel ring about Volga city; Russian recapture of Velikie Lukie on northern front and Elista on Caucasus front announced. ¶ German people were told by Hitler in his annual New Year's message that winter of 1943 would be hard, but no harder than winter of 1942. ¶ Gen. Zhukov's replacement of Marshal Timoshenko as Russian commander on the southern front was revealed in Russian press.
- 3. Caucasus town of Mozdok was retaken by Russian armies, soviet communiqué announced. ¶ Allied forces crushed all Japanese resistance in Buna Mission sector and moved toward Sanananda area, United Nations communiqué said.
 - 4. U.S. forces opened offensive on Guadalcanal.

- 5. Russian armies captured Tsimlyansk in Don river loop, Moscow announced.
- 7. Pres. Roosevelt, in speech before joint session of 78th congress, predicted substantial Allied victories in 1943.
- 8. Allied fliers smashed Japanese convoy attempting to land troops at Lae in New Guinea in 2-day battle.
- 9. Maj. Gen. Carl A. Spaatz of U.S. army air force assumed command of newly created Allied air force in North Africa.
- 11. Pres. Roosevelt asked congress for wartime budget of \$108,903,047,923 for fiscal year of 1944. ¶ Loss of aircraft carrier "Hornet" in battle of Santa Cruz Islands, Oct. 26, 1942, disclosed by U.S. navy. ¶ Georgievsk, Pyatigorsk and Mineralne Vodi, in Caucasus, were retaken by Red army.
- 14. Pres. Roosevelt and Prime Minister Churchill met in Casablanca to confer on war strategy.
- 16. Russians opened new offensive on Voronezh front, Moscow communiqué announced. ¶ Iraq declared war on Germany, Italy and Japan.
- 17. Millerovo, rail junction north of Donets river, was recaptured by Russian forces. § British 8th army resumed offensive in Libya, advancing 40 mi. beyond original German positions in Wadi Zemzem area.
- 18. German siege around Leningrad was eased as Russians smashed through nine mi. of fortifications to recapture Schlusselburg fortress, a soviet communiqué announced. ¶ Postmaster Gen'l Frank C. Walker was unanimously elected chairman of Democratic National committee, succeeding Edward J. Flynn. ¶ U.S. supreme court upheld lower bench verdict finding American Medical association guilty of violating antitrust law.
- 19. Marcel Peyrouton was named governor general of Algeria by Gen. Giraud.
- 20. Chile severed relations with Germany, Italy and Japan. ¶ British 8th army, closing in on Tripoli, captured

President Roosevelt reviewing a tank unit in French Morocco during his surprise visit to the Mediterranean front for a conference with Prime Minister Churchill on war strategy in Jan. 1943

- near-by Homs and Tarhuna. ¶ Majority of striking anthracite miners, heeding Pres. Roosevelt's warning to resume jobs or face government action, voted to return to pits, ending 22-day strike.
- 21. Maj. Gen. Alexander M. Patch of U.S. army succeeded Maj. Gen. Alexander A. Vandegrift of marine corps on Guadalcanal.
- 22. Germans lost Salsk to Russian column advancing swiftly toward Rostov. ¶ Fall of Sanananda was announced by Allied command in Australia.
- 23. Tripoli fell to British 8th army. ¶ Russian forces smashed through German lines in Caucasus to recapture Armavir.
- 24. Allied war strategy for 1943 called for "unconditional surrender" of axis, Roosevelt declared at end of 10-day parley with Churchill at Casablanca.
 - 25. U.S. troops occupied Kairouan pass in Tunisia.
- 28. White House statement disclosed that Pres. Roosevelt visited Liberia after leaving Casablanca; Pres. Roosevelt and Pres. Vargas conferred aboard U.S. destroyer at Natal, Brazil.
 - 29. Gen. Giraud rejected political union with Gaullists.
- 30. Russian armies recaptured Tikhoretsk and Maikop, a special soviet communiqué announced. ¶ Adm. Karl Doenitz, U-boat commander, succeeded Grand Adm. Erich Raeder as commander in chief of German navy. ¶ Cruiser "Chicago" was sunk by Japanese in Solomon area.
- 31. Complete destruction of German army of 330,000 in Stalingrad trap and capture of Reich Marshal Friedrich von Paulus and 16 other generals was announced in special Russian communiqué. ¶ Ground fighting flared in Tunisia when U.S. tank and infantry forces struck at German positions at Faid pass and at Maknassy farther south. ¶ Mussolini ousted Marshal Ugo Cavallero as chief of general staff, replacing him with Gen. Vittorio Ambrosio.



FEBRUARY, 1943

- 1. Pres. Roosevelt withdrew nomination of Edward J. Flynn as minister to Australia at latter's request.
- 2. Churchill and Turkish President Ismet Inönü conferred at Adana, and agreed on measures to help Turkey strengthen its defenses, British foreign office announced.
- 5. Mussolini ousted 12 of his most important aides, including Count Ciano, and himself assumed "entire burden" for conduct of military and political affairs. ¶ Lt. Gen. Frank M. Andrews assumed command of U.S. forces in European theatre of war.
- 7. Shoe rationing at initial rate of approximately three pairs yearly per person decreed by OPA. ¶ Appointment of Count Ciano as Italian ambassador to Vatican was announced by Rome radio.
- 8. Strongly fortified nazi base of Kursk was captured by Russians.
- 9. Minimum 48-hr. work week in war industries was decreed by Pres. Roosevelt. ¶ Belgorod was captured by Red army column pressing toward Kharkov. ¶ U.S. troops won complete control of Guadalcanal as Japanese abandoned island, Sec'y Knox declared.
- 11. Prime Minister Churchill pledged Allies would make nazis "burn and bleed" on fronts other than Russia, in statement before commons. ¶ Japanese were decisively defeated in 12-day battle near Wau, New Guinea, according to Allied communiqué.
- 12. Russian armies reoccupied Krasnodar. § U.S. marine corps announced establishment of new women's corps with Mrs. Ruth Cheney Streeter as director.
 - 14. Rostov and Voroshilovgrad fell to Russian armies.
- 15. Risto Ryti was re-elected president of Finland on first ballot. ¶ Maj. Gen. Ira C. Eaker was appointed commander of 8th U.S. army air force.
- 16. Soviet troops captured Kharkov, anchor of German line on southern Russian front. ¶ U.S. forces in central Tunisia were routed by Marshal Rommel's panzer divisions which staged swift 22-mi. advance to outskirts of Sbeitla. ¶ Archbishop Spellman of New York conferred with Gen. Francisco Franco in Madrid.
- 18. Rommel's panzers, led by new Mark VI tanks, hurled U.S. and French troops back to Algerian border and occupied towns of Feriana, Kasserine and Sbeitla. ¶ Japanese forces opened offensives in seven different areas in China, Chungking announced. ¶ Mme. Chiang Kai-shek challenged "prevailing opinion" that defeat of Hitler was first concern of United Nations and called for decisive blows against Japan in speeches before both houses of U.S. congress. ¶ Sales of canned meat and fish were frozen by OPA.
- 19. At joint conference with Mme. Chiang Kai-shek, Pres. Roosevelt pledged that U.S. would rush more arms to China "as fast as the Lord will let us."
- 20. Both Krasnograd and Pavlograd fell to Russian columns sweeping westward in Ukraine. ¶ German mechanized units in Tunisia pierced Anglo-American defenses and occupied strategic Kasserine pass.
- 21. Marshal Timoshenko opened new Russian offensive on Lake Ilmen sector south of Leningrad.
- 23. Stalin said that Red army alone was bearing whole weight of war in absence of second front. ¶ Capture of Sumy in Ukraine capped Russian advance of 82 mi. in seven days. ¶ Anglo-U.S. forces halted German drive on Thala in Tunisia, after 24-hr. battle.
- 24. Adolf Hitler warned he would force workers from occupied lands to help nazi war effort and that he would

not spare foreign lives in struggle.

- 25. U.S. forces occupied Kasserine gap in central Tunisia after Rommel's forces withdrew to shorten their communications.
- 26. Disclosure that U.S. was exporting large supplies of oil, cotton and food to Spain was made by Carlton J. H. Haves, U.S. ambassador to Madrid.
- 28. German armies counterattacking in Donets basin recaptured Losovaya and Kramatorsk, nazi high command announced.

MARCH, 1943

- 1. U.S. army forces pierced axis lines at outlet of Kasserine pass and recaptured Tunisian town of Sbeitla. ¶ Russian forces captured Demyansk and 301 other localities in Lake Ilmen sector, Moscow communiqué said. ¶ U.S. supreme court reversed conviction of George Sylvester Viereck, German propagandist, and criticized prosecution for remarks prejudicial to fair trial. ¶ Juan José de Amezaga assumed office as president of Uruguay.
- 3. Red army took Rzhev after prolonged and violent battle. ¶ Mohandas K. Gandhi ended 21-day hunger strike.
- 4. Allied bombers destroyed entire Japanese convoy of 22 ships, including 10 warships and 12 transports, in battle of Bismarck sea, beginning March 2; 82 Japanese planes were downed and 15,000 troops aboard transports were virtually annihilated. ¶ Red army regained control of Velikie Luki rail link to Moscow and routed two German garrisons below Lake Ilmen area.
- 5. Edwin J. Linkomies became premier of Finland at head of coalition cabinet. ¶ British Colonial Secretary Oliver Stanley, answering U.S. critics, said Britain would not agree to any scheme for international postwar rule of its colonies.
- 6. Russians captured Gzhatsk in drive to iron out deep bulge protecting Smolensk. ¶ Stalin was given rank of marshal of soviet union, Moscow radio announced.
- 8. Complaints that soviet government was concealing from Russian people importance of lend-lease aid shipped to Russia were voiced by Adm. Standley, U.S. ambassador at Moscow. ¶ Ismet Irönü was unanimously re-elected president of Turkey by national assembly.
- 9. Surprise drive by nazi army of 375,000 in Kharkov area compelled Russians to retreat 80 mi. to protect overextended communications, Russians said.
- 11. Pres. Roosevelt signed bill extending Lend-Lease act for another year.
- 12. House rebuffed Pres. Roosevelt by approving measure to revoke president's order limiting salaries to \$25,000 net yearly. ¶ Red army occupied Vyazma in drive toward Smolensk.
- 14. Recapture of Kharkov by reich armies on southern Russian front was announced by German high command.
- 17. Restoration of laws of French republic to North Africa were decreed by Gen. Giraud. ¶ Gafsa fell to U.S. infantrymen in 30-mi. advance toward El Guettar in Tunisian hills. ¶ Gen. Franco voiced fears, in speech to cortes, that "Red Revolution" would engulf Europe if U.S.S.R. defeated reich.
- 18. El Guettar was captured by U.S. tank forces advancing in central Tunisia.
- 19. Eight members of Capone gang were indicted in New York city on charges of fleecing motion picture union and employers of \$2,500,000; Frank Nitti, alleged leader of movie racket, was found shot to death in Chicago suburb five hours after indictment.
- 20. De Gaulle and Giraud French factions clashed over control of French Guiana, with both sides claiming author-

ity over South American colony. ¶ Chinese forces recaptured Hwajung, city in eastern Hunan province, and slowed Japanese offensive south of Yangtze river.

- 21. Prime Minister Churchill proposed postwar councils of nations for Europe and Asia, under which small nations would be grouped in federations. ¶ Russians admitted German recapture of Belgorod, 50 mi. north of Kharkov. ¶ OPA suddenly halted sales of butter, edible fats and oils.
- 22. WLB rejected, by 8 to 4 vote, A.F. of L.'s petition to scrap "Little Steel" formula for wage increases.
- 23. British 8th army punctured Rommel's Mareth line at coast and outflanked it from south, as U.S. forces occupied Maknassy. ¶ Complete occupation by Allied troops of Mambare river area in New Guinea was announced by Allied headquarters. ¶ Danes overwhelmingly rejected national socialism in parliamentary elections, giving 1,898,360 votes to democratic parties and only 67,977 votes to two pro-German parties.
- 24. OPA announced ration point values for meat, butter and cheese.
- 25. Chester C. Davis was named food administrator by Pres. Roosevelt.
- 26. British Foreign Sec'y Anthony Eden promised Chinese that Allies would give them more military assistance, in speech before Maryland general assembly. ¶ Soviet Russia extended its fisheries agreement with Japan for another year.
- 27. U.S. troops punched 20-mi. hole in axis lines in central Tunisia and captured position of Fondouk.
- 28. British 8th army breached Mareth line at three points, forcing hasty axis retreat toward Gabes.
 - 30. Tunisian port of Gabes fell to British 8th army.

APRIL, 1943

- 4. Allied bombers sank or damaged 12 Japanese warships and merchant craft after three big raids in four days on enemy shipping concentrated at Kavieng, New Ireland.
- 5. Wilhelmstrasse announced that Daladier, Blum, Gamelin and Reynaud had been removed to German prisons.
- **6.** U.S. proposals for establishment of United Nations fund for postwar currency stabilization were made public by Sec'y Morgenthau.
- 7. Elements of U.S. 2nd army corps and British 8th army formed junction at Djebel Chemsi. ¶ Pres. Enrique Peñaranda declared Bolivia at war against axis and decreed general mobilization. ¶ Lord Keynes' proposal for postwar banking and currency plan to expand world trade was published in British White Paper.
- 8. Common Wealth party, with platform of nationalization of British resources, won first seat in house of commons.
 - 10. Hitler and Mussolini concluded four-day conference.
- 11. Public debt extension bill, containing repeal of Pres. Roosevelt's order limiting salaries to \$25,000 yearly net after taxes, became law. § Desert junction of Kairouan was taken by Anglo-U.S. armoured units of British 1st army.
- 12. British 8th army advanced 48 mi. in single day and captured Sousse, Tunisian port. ¶ British budget calling for £5,756,114,000 was introduced to commons by Sir Kingsley Wood, chancellor of exchequer.
- 14. Gen. MacArthur warned that powerful Japanese naval forces were within "striking distance" of Australia.
- 16. Senate voted to deprive Pres. Roosevelt of right to devalue currency.
- 17. Regulations designed to freeze 27,000,000 U.S. workers to their jobs were issued by WMC chief, Paul V. Mc-

Nutt. ¶ Carlo Scorza was made secretary general of Italian fascist party, succeeding Aldo Vidussoni.

- 20. Pres. Roosevelt and Pres. Avila Camacho met in Monterrey, Mexico. ¶ Aircraft carrier "Hornet" was revealed by U.S. war dep't as "Shangri-La" from which U.S. planes took off to bomb Tokyo in April 1942; "Hornet" was subsequently sunk.
- 21. Japanese execution of several of eight captured U.S. airmen who participated in Tokyo raid announced by Pres. Roosevelt. ¶ Capture of Enfidaville on Tunisian coast by British 8th army was announced in Allied communiqué.
- 22. Japan hinted more reprisals if U.S. planes again bombed Tokyo, declaring that all U.S. fliers captured on such expeditions would be given "one-way tickets to hell." ¶ 20 giant six-engined German transport planes carrying troops and gasoline to Tunisia were shot down by Allied warplanes.
- 23. Navy department revealed U.S. forces had occupied and established base on Ellice Islands in Southwest Pacific.
- 24. General offensive was launched by Allied forces on all Tunisian fronts.
- 26. Moscow, angered at Polish reports that Russians "massacred" 10,000 Polish prisoners, broke off relations with Polish government-in-exile in London. ¶ Categorical denial of nazi claim that U.S. aircraft carrier "Ranger" had been sunk by nazi U-boat was issued by U.S. navy department.
- 29. Creation of joint U.S.-Mexico economic committee to help remedy dislocation in Mexico's wartime economy was announced by state department.
- 30. OPA Administrator Prentiss M. Brown announced program to halt inflation by rolling back prices that got "out of hand" and by extending price control to "every important commodity." ¶ U.S. state department severed political ties with pro-Vichy regime on Martinique and Guadeloupe.

MAY, 1943

- 1. Premier Stalin lauded Allied air attacks on axis centres in Italy and Germany, declaring these raids presaged opening of second front.
- 2. John L. Lewis called 15-day truce in coal strike 30 min. before Pres. Roosevelt went on nation-wide broadcast to denounce miners' walkout as blow at war effort.
- 3. Mateur fell to U.S. Tunisian forces which consolidated positions only 18 mi. from Bizerte.
- 4. Russell Islands, northwest of Guadalcanal, were occupied by U.S. forces in February, U.S. navy department announced.
- 5. Premier Stalin expressed desire to see strong and independent Poland established after war. ¶ Fuel Administrator Ickes was given power to seize all coal stocks.
- 6. Lt. Gen. Jacob L. Devers was named commander of U.S. forces in European theatre, succeeding Lt. Gen. Frank M. Andrews, killed in plane crash.
- 7. Tunis and Bizerte fell to British and U.S. forces 181 days after Allied landings in North Africa. ¶ Occupation of Aleutian island of Amchitka by U.S. forces in January was announced by U.S. navy department, which also declared that Adak, another Aleutian isle, had been occupied earlier.
- 9. Spanish dictator Franco appealed to Allies and axis to make peace, declaring that war had reached deadlock and that neither side could win. ¶ Withdrawal of British and Indian forces from Buthidaung, a Burma outpost, was

announced in British communiqué.

- 11. U.S. forces landed on Japanese-held island of Attu in Aleutians.
- 12. All axis resistance in Tunisia ended; Col. Gen. von Arnim and other axis military leaders surrendered to Allies. § At least 4 and possibly 10 U-boats were sunk by Allied escort ships and planes after 8-day running battle in Atlantic with pack of 25 axis submarines that attacked convoy, admiralty announced.
- 14. 299 persons perished when Japanese submarine torpedoed Australian hospital ship "Centaur."
- 15. Sidi Lamine was appointed bey of Tunis, succeeding Sidi Mohammed al Mounsaf, who was ousted by Gen. Giraud for compromising his position during axis occupation, French communiqué announced.
- 16. Ruhr valley was flooded after R.A.F. bombings breached Eder, Sorpe and Moehne dams.
- 18. Pres. Roosevelt opened United Nations food conference in Hot Springs, Va., with appeal to waive food tariffs.
- 19. Prime Minister Churchill told U.S. congress Britain would help raze Japanese cities, after destruction of Germany.
- 20. Joseph E. Davies presented Premier Stalin with personal letter from Pres. Roosevelt.
- 22. Dissolution of Comintern (Communist international) was decided upon by praesidium of Comintern's own executive committee in Moscow. ¶ All except three of U.S. warships sunk and damaged at Pearl Harbor had been refloated and repaired and were back in service, U.S. announced.
- 23. Destruction of 305 axis planes in four days by Allied air forces operating in central Mediterranean area was announced. § Italian isle of Pantelleria bombed in four Allied raids in 48 hr.
- 25. Italian people were advised to quit war by Prime Minister Churchill in joint press conference with Pres. Roosevelt.
- 27. British and U.S. military leaders reached "complete agreement" on future operations in all war theatres, Pres. Roosevelt announced. J Majority of 52,000 wildcat strikers in Akron rubber plants heeded Pres. Roosevelt's ultimatum to end walkout and returned to jobs.
- 28. Russian force of 150,000 men drove wedge into German defenses in small Kuban salient held by nazis, Berlin radio announced. ¶ James F. Byrnes was made director of new Office of War Mobilization.
- 30. Japanese imperial headquarters admitted entire Japanese garrison on Attu had been wiped out by U.S. attack.
- 31. British foreign office spokesman said French warships interned in Alexandria had joined Allies. ¶ Routing of 75,000 Japanese troops with heavy losses on front southwest of Ichang was announced in Chungking communiqué.

June, 1943

- 1. Gen. de Gaulle's insistence on removal of former Vichy officials from office in French Africa forced resignation of Marcel Peyrouton as governor general of Algeria. ¶ Gen. Ezio Rossi was removed as chief of staff of Italian army by Premier Mussolini.
- 3. Pres. Roosevelt ordered striking miners to return to work by June 7. ¶ Resolutions for creating "new world order" based on freedom from want were approved by delegates at final session of United Nations food conference. ¶ French Committee of National Liberation was created as instrument to govern French empire with Gen-

erals de Gaulle and Giraud serving as co-presidents.

- 4. Argentine army officers staged swift coup d'état, overthrew Castillo regime and seized government. ¶ 530,000 striking coal miners were ordered to return to work on June 7 by John L. Lewis, U.M.W. chief.
- 5. Gen. Arturo Rawson was proclaimed president of Argentina.
- 7. Gen. Pedro Pablo Ramírez became president of Argentina after Gen. Arturo Rawson stepped down in his favour.
- 8. Los Angeles declared out of bounds by army and navy authorities as result of rioting between "zoot-suiters" and servicemen.
- 10. Pay-as-you-go tax measure was signed by Pres. Roose-velt and was scheduled to become operative July 1. ¶ Prime Minister John Curtin of Australia declared Allied defensive strategy in Pacific had ended and that period for offensive operations against Japanese had arrived.
- 11. Bomb-ruined island of Pantelleria surrendered to Allied forces.
- 12. Italian island of Lampedusa, near fallen Pantelleria, surrendered to Allies.
- 13. Garrison of 140 Italian sailors and soldiers on tiny isle of Linosa in Mediterranean surrendered without fight.

 ¶ Revolution as an instrument of labour policy was condemned by Pope Pius XII.
- 14. Ruling compelling school children to salute flag was reversed by supreme court.
- 15. Buckingham palace officials revealed that King George VI was visiting British forces in North Africa.
- 17. Standard Oil Co. of Calif. agreed to drop contract for oil drilling on naval Elk Hills tract, Sec'y Knox said.
- 18. Appointment of Field Marshal Sir Archibald Wavell as viceroy of India was announced by British government.

 ¶ Argentine presidential elections were suspended by Gen.
 Ramírez.
- 21. 25 Negroes and nine whites were killed and hundreds were injured in race riots in Detroit.
- 22. Coal strike was called off by John L. Lewis, who extended truce until Oct. 31.
- 25. Both houses of congress overrode Pres. Roosevelt's veto of Smith-Connally anti-strike bill.
- 28. Hundreds of R.A.F. planes carried nonstop aerial offensive over occupied Europe into tenth day. ¶ Chester C. Davis resigned as war food administrator and stated program to halt inflation would not work; Judge Marvin Jones succeeded Davis.
- 29. Vice-President Wallace charged Sec'y of Commerce Jesse Jones with employing "obstructionist" tactics against the Board of Economic Warfare while Jones accused vice-president of "malice" and "misstatements."
- 30. U.S. army, navy and air forces launched offensive to drive Japanese out of New Guinea and northern group of Solomon Islands, and captured Trobriand and Woodlark islands in early stages of drive. ¶ Axis powers were warned by Prime Minister Churchill that Allied attacks against European mainland were imminent "before leaves of autumn fall." ¶ U.S. troops occupied Rendova Island after wiping out Japanese garrison there.

JULY, 1943

- 1. Death sentence of Max Stephan, who aided escaped nazi flier, was commuted to life imprisonment by Pres. Roosevelt. ¶ New Irish Dail Eireann re-elected Eamon de Valera premier of Eire government.
- 4. Fully loaded glider was towed 3,500 mi. across Atlantic in 28 hr., R.A.F. authorities announced.
- 5. Germans ended 101-day lull on Russian front by

opening offensive in Orel-Kursk-Belgorod sectors. ¶ Japanese cession of six states of Malaya and Burma to Thailand as reward for that kingdom's "collaboration" was announced by Tokyo radio. ¶ U.S. shock troops landed near Bairoko and Zanana (New Georgia island) in drive on Munda air strip.

6. At least nine Japanese warships—and possibly two others—were sunk in battle of Kula gulf, July 5–6, as against announced loss of one U.S. cruiser, Allied communiqué said.

7. Gen. Henri Giraud reached Washington and conferred with Pres. Roosevelt. ¶ Russians admitted German penetration near Belgorod.

9. Pres. Roosevelt, parrying question of recognition of French committee, said that as 95% of French were under German rule, there was no France.

10. U.S., British and Canadian troops invaded Sicily, consolidated beachheads on southern shores and drove forward along 100-mi. front. ¶ Truman committee report charged that Curtiss-Wright subsidiary caused government to accept allegedly defective engines.

11. Three Italian airfields and city of Pachino were captured by Allied troops in Sicily; Syracuse and nine other Sicilian towns were also captured, Allied communiqué announced. ¶ German armies fell back before sharp Russian counterthrusts in Kursk-Orel sector.

12. Japan lost four more warships in another engagement with U.S. naval units in Kula gulf area.

13. Gen. Montgomery's British 8th army captured Augusta on Sicily's east coast while Gen. Patton's American 7th army joined British and Canadian forces at Ragusa. ¶ Adm. Georges Robert resigned as high commissioner for Martinique and Henri-Etienne Hoppenot was named as his successor, U.S. state department announced.

14. Stanislaw Mikolajczyk was named premier of Polish government in exile, replacing late Gen. Sikorski.

15. Pres. Roosevelt abolished Board of Economic Warfare, curbed foreign operations of RFC, and created new agency called Office of Economic Warfare; he rebuked both Vice-President Wallace and Jesse H. Jones for public airing of their inter-agency quarrels. ¶ Recapture of 110 towns and villages in substantial advances on Orel front was announced in soviet communiqué. ¶ U.S. and Australian troops recaptured Mubo area in New Guinea, Allied communiqué announced.

16. Italy was warned to overthrow fascism or suffer tragic ruin of war in joint statement by Pres. Roosevelt and Prime Minister Churchill.

17. Seven Japanese vessels were sunk and 49 planes were shot down by 200 Allied planes attacking Buin-Faisi area of Bougainville Island during battle on July 16–17. ¶ Anglo-U.S. military occupation rule was set up in Sicily with Gen. Sir Harold R. L. G. Alexander as military governor. ¶ Agrigento fell to vanguards of Gen. Patton's U.S. 7th army driving along south coast of Sicily, Allied communiqué said.

19. Rome was raided for first time by 500 U.S. daylight bombers. ¶ Germans abandoned 130 villages and populated places to advancing Red army forces driving on big nazi base of Orel. ¶ Hitler and Mussolini conferred in northern Italy on axis military plans. ¶ "Big Inch," world's longest oil pipe line, extending from Longview, Tex., to Phoenixville, Pa., was dedicated.

20. Japanese cruiser and two destroyers were sunk by U.S. planes in dawn battle in Vella gulf, northwest of New Georgia. ¶ U.S. and Canadian troops captured Enna, important communications hub in central Sicily.

22. Allied bombers attacked Surabaya in Netherlands

Indies during 2,400-mi. round-trip flight. ¶ U.S. 7th army smashed inland through Sicily and captured Palermo.

24. U.S. forces captured port of Marsala and rounded up 50,000 prisoners in western portion of Sicily, Allied communiqué announced. ¶ Vatican radio denied axis reports that Pope Pius XII had protested to Pres. Roosevelt over bombing of Rome.

25. Benito Mussolini resigned as dictator of Italy; King Victor Emmanuel III named Marshal Pietro Badoglio as successor.

27. Italy was given choice by Prime Minister Churchill of breaking alliance with Germany or of being "seared and scarred and blackened." ¶ OWI was rebuked by Pres. Roosevelt for referring, in short-wave broadcast to Europe, to King Victor Emmanuel III as "moronic little king" and to Marshal Badoglio as "high-ranking fascist."

28. Rome radio announced abolition of fascism in Italy. ¶ Pres. Roosevelt hailed fall of Mussolini as "first crack in axis."

29. Nicosia on axis defense line at Mt. Etna, Sicily, was captured by U.S. infantry. ¶ Italians were offered honourable peace by Gen. Eisenhower if they would rid their country of Germans.

30. Pres. Roosevelt warned neutral countries not to give asylum to fleeing axis "war criminals."

31. French Committee of National Liberation appointed Gen. de Gaulle chairman of national defense committee and Gen. Giraud commander in chief of all French forces.

AUGUST, 1943

1. Force of 175 U.S. Liberator bombers flying at low altitude devastated oil refineries in Ploesti region of Rumania with 300 tons of explosives.

5. Sicilian port of Catania fell to British 8th army. ¶ Red army captured both Orel and Belgorod in drive that shattered axis defenses in south central Russia. ¶ Sweden cancelled transit of German troops and war materials through its territory to Finland and Norway. ¶ U.S. soldiers and marines captured Munda on New Georgia Island.

6. Troina, key axis stronghold in Sicily, was occupied by U.S. 7th army after heavy fighting.

7. U.S. naval forces sank three of four Japanese warships that attempted to carry supplies to beleaguered garrison at Vila on Kolombangara Island, in battle on night of Aug. 6–7.

8. Occupation of Adrano, Bronte, Biancavilla and Belpasso by British 8th army in Sicily was announced in Allied communiqué. ¶ Former French liner "Normandie" was refloated at 49° list in New York pier. ¶ U.S. troops, landing behind axis lines on north Sicilian coast, enabled main body of U.S. 7th army to capture Sant' Agata di Militello and San Fratello.

10. Prime Minister Churchill arrived in Quebec for conferences with Allied high command. ¶ Bozidar Pouritch succeeded Milos Trifunovitch as prime minister of Yugoslav government in exile.

12. Chuguyev, 22 mi. from Kharkov, fell to Russian troops, a Moscow communiqué said.

13. Lt. Gen. Patton's 7th U.S. army captured Randazzo in Sicily.

14. Badoglio government announced decision to declare Rome open city, according to Vatican City broadcast.

15. Red army overran German defense bastion of Karachaev. ¶ U.S. forces by-passed Kolombangara Island to occupy Vella Lavella Island in central Solomons. ¶ U.S. and Canadian forces occupied Kiska and found that all

Japanese forces had fled island before Allied landings.

17. All Sicily fell to Allied armies 38 days after invasion began; U.S. troops occupied Stromboli and Lipari, two islands of Aeolian group in Tyrrhenian sea north of Sicily.

- 21. Japanese retreat from outer defenses of Salamaua to inner lines protecting base's aerodrome was disclosed in Allied communiqué. ¶ Andrei A. Gromyko was named soviet ambassador to U.S., replacing Maxim Litvinov.
- 23. Kharkov was recaptured in Russian drive to free entire Donets basin.
- 24. Pres. Roosevelt and Prime Minister Churchill, concluding their Quebec conference, expressed hope that it would be possible to hold Anglo-U.S.-Soviet parleys. § Heinrich Himmler was named German interior minister, thus receiving virtual dictatorial powers to curb unrest in reich.
- 25. Adolf Hitler and reichswehr generals were warned by Pres. Roosevelt that "surrender would pay them better now than later." ¶ Establishment of separate Allied Southeast Asia Command and appointment of Lord Louis Mountbatten as its commander was announced.
- 26. U.S., Britain and Canada recognized French Committee of National Liberation as administrative authority for French overseas territory, but not as government of France or French empire.
- 28. Allied headquarters announced that all Japanese resistance on New Georgia Island had ended.
- 29. Danes revolted against German measures placing country under martial law.
- 30. Soviet armies recaptured Taganrog, southern anchor of German line in U.S.S.R. ¶ Resignation of Premier Eric Scavenius' cabinet and internment of Danish royal family at Amalienborg under German military guard reported in Swedish dispatches. ¶ Sec'y Hull branded statements by Drew Pearson, columnist, that secretary of state was anti-Russian as "monstrous and diabolical falsehoods." ¶ Argentina's bid for lend-lease arms was flatly rejected by Sec'y Hull who sharply criticized Ramírez government's foreign policy on hemispheric defense.
- 31. Yelnya and Dorogobuzh fell to Russians opening direct drive on Smolensk, main German defense bastion on central Russian front. ¶ Prime Minister Churchill invited soviet union to join with Britain and U.S. in "necessary and urgent" conference of foreign ministers.

SEPTEMBER, 1943

- 1. Pope Pius, in broadcast on fourth anniversary of World War II, called for "worthy peace" and generous treatment of defeated nations.
- 2. Annihilation of 40,100 German troops in Taganrog sector was claimed in Russian communiqué; Russian armies captured Sumy and cut Bryansk-Kiev railway.
- 3. Italy was invaded by British and Canadian troops who established bridgehead in Calabria and advanced toward Palmi.
- 4. Capture of Reggio di Calabria and Villa San Giovanni by British 8th army announced in Allied communiqué.

 ¶ William M. Jeffers resigned as U.S. rubber director.
- 5. Japanese evacuation of important seaplane base at Rekata bay on Santa Isabel Island in Solomons was announced.
- 6. Surprise Allied amphibious landings isolated Japanese forces in Salamaua-Lae area, Allied communiqué announced. ¶ U.S. and Britain should continue co-operation for postwar organization and peace, Prime Minister Churchill declared in speech at Harvard university.

- 7. Statement urging U.S. participation in postwar cooperative organization was unanimously approved by Republican postwar advisory council meeting at Mackinac Island, Mich.
- 8. Italy surrendered unconditionally to United Nations; Gen. Eisenhower revealed that he had concluded secret armistice with Badoglio government on Sept. 3; Italy's capitulation was branded a "cowardly betrayal" by Berlin newspapers. ¶ Stalino fell to Russians as Red army cleared out nazi forces in Donets basin. ¶ Arctic island of Spitsbergen was bombarded by German warships.
- 9. Allied 5th army troops landed and established bridgeheads in Salerno region south of Naples. ¶ Badoglio informed Hitler that Italy had been forced to ask for armistice to avoid total ruin, Rome broadcast disclosed. ¶ German bomber sank 35,000-ton Italian battleship "Roma" as it was steaming toward Allied port.
- 10. Rome was shelled and occupied by German troops; elimination of Italy as belligerent was unimportant from military standpoint, Hitler asserted. ¶ Allied 5th army beat off five powerful German counterattacks on Salerno bridgehead.
- 11. Italian General Vittorio Ruggiero surrendered to German forces which occupied Lombardy. ¶ Major part of Italy's fleet, including 4 battleships, 9 cruisers and 11 destroyers, surrendered to Allies at Malta, London reports said. ¶ Italian people were urged to strike hard against German soldiers on Italian soil in joint statement by Prime Minister Churchill and Pres. Roosevelt. ¶ Capture of port of Salerno by Allied 5th army was announced in Allied communiqué. ¶ King Victor Emmanuel and Premier Badoglio appealed to Italians not to resist Allied forces but to defend homeland against "German aggression."
- 12. Occupation of Brindisi by British troops was announced in Allied communiqué. ¶ Eight more Italian destroyers and 14 submarines surrendered to Allies at Malta, British naval authorities said. ¶ Mussolini was freed by nazi parachute troops who overwhelmed Italian jailers and took him to German-held territory. ¶ Australian and U.S. forces captured Salamaua, important Japanese base in New Guinea.
- 13. Kuomintang's central executive committee named Generalissimo Chiang Kai-shek as president of Chungking government.
- 14. German tank, artillery and troop attacks hurled back Allied 5th army on Salerno bridgehead.
- 16. Split was captured by partisan armies, Yugoslav communiqué said. ¶ Novorossisk was recaptured by Russian armies in Kuban drive. ¶ Japanese-held base of Lae fell to Australian troops pushing westward across northern coastline of New Guinea.
- 17. Pres. Roosevelt told congress that he and Churchill were agreed on time and places for launching of new blows against axis in Europe and Asia. ¶ Bryansk was recaptured by Russians.
- 18. Allied 5th army widened Salerno bridgehead and captured Roccadaspide. ¶ Pavlograd was occupied by Red army divisions, Russian communiqué said. ¶ Battipaglia and Altavilla fell to Allied 5th army forging ahead in Salerno area.
- 19. German garrisons were driven out of Sardinia by two Italian divisions, Allies disclosed. ¶ Yugoslav communiqué reported Germans launched big land drive to oust partisans from Fiume and Split.
- 20. Willkie announced willingness to "accept" presidential nomination in 1944 campaign from "liberal" Republican party. ¶ Landing of French forces on Corsica

was announced by Gen. Giraud in special communiqué. ¶ Allied occupation of most of Sorrento peninsula dominating Bay of Naples was announced in Allied communiqué.

21. Prime Minister Churchill told commons that Allies would invade Europe from west in due time; he said Italy had "irretrievably" lost its empire. ¶ Allied landings on the Aegean islands of Cos, Samos and Leros were announced in British middle east communiqué.

22. Allied forces made new landings above Finschhafen in new drive against Japanese-held New Guinea base. ¶ Complete annihilation of Japanese garrison on Arundel Island was announced in Allied communiqué.

23. Establishment of nazi-sponsored Italian government with Mussolini as premier and Gen. Graziani as defense minister was announced in German broadcast.

24. Churchill reshuffled cabinet, naming Sir John Anderson chancellor of exchequer and Lord Beaverbrook lord privy seal.

25. Russian armies recaptured Smolensk and Roslavl and battled way into suburbs of Kiev. ¶ Pres. Roosevelt announced resignation of Sumner Welles as undersecretary of state and appointed Edward R. Stettinius, Jr., as his successor; president also disclosed creation of Office of Foreign Economic Administration with Leo T. Crowley as director of new agency.

26. Berlin radio admitted that Russian forces had crossed Dnieper river at some points.

27. Foggia and its network of Italian air bases fell to British 8th army after 24-mi. advance.

28. Nazi seizure of Corfu and recapture of Split from Yugoslav partisans were announced in German communiqué.

OCTOBER, 1943

- 1. Allied 5th army occupied Naples. ¶ Adm. William H. Standley resigned as U.S. ambassador to Moscow and W. Averell Harriman was appointed his successor.
- 2. New Guinea base of Finschhafen fell to Australia's veteran 9th division.
- 3. German communiqué admitted nazi armies had evacuated Kuban city of Taman.
- 4. Bastia was occupied by French troops in Corsican campaign.
- 5. Aegean island of Cos was recaptured from British by German landing parties after two-day battle. ¶ All German troops were cleared from Corsica.
- 7. Russian armies crossed Dnieper river and established three bridgeheads on west bank, Moscow announced. ¶ At least 100 persons were killed and scores of others injured by explosion of German time bomb in Naples post office.
- 8. Fall of Capua to Allied 5th army was announced in United Nations communiqué.
- 9. Clearing of all German troops from Caucasus was announced by Premier Stalin. ¶ Strategic base of Vila on Kolombangara Island was occupied by U.S. forces.
- 11. New York Yankees defeated St. Louis Cardinals, four games to one, to win baseball's world series.
- 12. Portugal agreed to allow Britain use of Azores as anti-submarine bases.
 - 13. Badoglio government declared war on Germany.
- 14. U.S. 8th air force lost 60 Flying Fortresses and 593 men in raid on Schweinfurt, but shot down 104 nazi planes. ¶ Dnieper bend stronghold of Zaporozhe was captured by Russian forces battling way south toward Crimea and Black sea. ¶ Allied 5th army threw several bridgeheads across Volturno after sharp fighting. ¶ German government filed formal protest with Portugal against grant to



An Italian woman kissing the hand of a U.S. officer who entered Naples with the U.S. 5th army. Occupation of the city began on Oct. 1, 1943, with heavy air support

Britain of naval and air bases in Azores. § Berlin broadcast asserted that Gen. Rommel had been put in charge of operations against Yugoslav partisans.

15. Argentine government lifted ban on Jewish newspapers after Pres. Roosevelt said act was "obviously antisemitic." ¶ Wendell Willkie made bid for G.O.P. presidential nomination with demand that Pres. Roosevelt and entire administration be voted out of office in 1944.

16 Pres. Ramírez summarily dismissed all Argentine public officials who had signed anti-axis manifesto calling for "effective democracy."

18. Sec'y Hull and Foreign Minister Eden arrived in Moscow for tripartite talks with Russian Foreign Commissar Molotov. ¶ Count Carlo Sforza arrived in Italy for conversations with leaders of Badoglio government.

19. Control of both banks of Volturno river from the Tyrrhenian sea to Capua was secured by the Allied 5th army.

21. Adm. Sir John H. D. Cunningham was named commander in chief of Allied fleet in Mediterranean. ¶ French Committee of National Liberation restored Crémieux decree, thus returning citizenship to disfranchised Algerianborn Jews. ¶ Prentiss M. Brown resigned as head of Office of Price Administration.

22. Brig. Gen. R. E. Laycock succeeded Lord Louis Mountbatten as chief of British combined operations.

23. Red army troops recaptured Melitopol after 11 days of street fighting.

25. Dnepropetrovsk was recaptured by Russian army.

¶ Allied 5th army occupied Sparanise and drew up to

foot of southern slopes of Mt. Massico.

26. Japanese diet was told by Emperor Hirohito that Japan's situation was "truly grave."

27. Allied forces landed on Mono and Stirling islands in first phase of Solomons campaign to drive Japanese from Bougainville.

28. U.S. paratroopers spearheaded Allied invasion of Choiseul Island in Solomons.

31. Count Sforza gave limited endorsement to Badoglio rule, but hinted that he desired abdication of King Victor Emmanuel III. ¶ Japanese-held Bougainville Island was invaded by U.S. marines who swarmed ashore at Empress Augusta bay on island's west shore.

NOVEMBER, 1943

- 1. Moscow parleys concluded by U.S. Sec'y of State Hull, British Foreign Sec'y Eden and Foreign Commissar Molotov, who agreed (1) to carry on Anglo-U.S.-Russian collaboration after war and (2) to compel axis powers to surrender unconditionally. Conferees also established machinery for closer military co-operation, created European Advisory commission and Italian Advisory council and guaranteed restoration of Austrian independence. ¶ Russian armies cut off last land escape route of German armies in Crimea by capturing Perekop, Moscow communiqué announced.
- 2. Republican party marked up impressive gains in elections throughout scattered districts of U.S. ¶ One Japanese cruiser and four destroyers were sunk in battle with U.S. naval units off Bougainville.
- 3. Striking coal miners were ordered to return to work by John L. Lewis after Sec'y Ickes gave tentative approval to \$1.50 daily wage boost.
- 4. Isernia, important German defense key in central Italy, captured by British 8th army.
- 6. Bernard M. Baruch was named to head new unit in OWM to deal with war and postwar adjustment problems. ¶ Russian armies recaptured Kiev, which they had lost to German invaders in Sept. 1941. ¶ U.S. housewives were warned by OPA chief, Chester Bowles, that food prices would be substantially increased if congress refused to sanction further subsidies.
- 8. Nazi party leaders were assured by Adolf Hitler in speech on 20th anniversary of Munich putsch that he would never capitulate.
- 9. Delegates of 44 nations convening in Washington signed agreement establishing United Nations Relief and Rehabilitation administration. ¶ Prime Minister Churchill warned that campaigns scheduled for 1944 to destroy German armies would entail "greatest sacrifices" of war for Anglo-U.S. armies. ¶ Gen. Giraud resigned from French Committee of National Liberation, but retained command of French armies in field; Gen. de Gaulle was left with full powers in reshuffle of French committee.
- 10. Gov. Bricker of Ohio announced he would enter Ohio presidential preference primaries.
- 11. German industrial centre of Muenster was raided by U.S. bombers. ¶ Herbert H. Lehman was unanimously elected director general of U.N.R.R.A. ¶ Nassau jury acquitted Alfred de Marigny of charge of slaying his fatherin-law, Sir Harry Oakes.
- 13. Rail junction of Zhitomir was captured by Russian units driving west of Kiev. I Marshal Badoglio organized "technical" government to carry on administrative affairs, but vowed to take no part in policy-making; the next day he said he would resign as premier when Rome was lib-

erated, but pledged loyalty to King Victor Emmanuel.

- 15. Buckingham palace announced appointment of duke of Gloucester to succeed Lord Gowrie as governor-general of Australia.
- 17. Dodecanese island of Leros was recaptured by Germans, British admitted.
- 19. Zhitomir was recaptured by German armies as Russians retreated in their first major reverse in four months of battle on eastern front.
- 20. U.S. marines invaded Gilbert Islands, landing on Tarawa and Makin atolls.
- 21. French Committee of National Liberation ordered release of arrested Lebanese leaders and promised to give mandated area independence.
- 22. Landing of U.S. marines on Abemama, third atoll in Gilbert group, was announced.
- 23. Tarawa was occupied by U.S. marines after bitter and sanguinary 76-hr. battle.
- 24. U.S. escort carrier "Liscome Bay" was sunk by Japanese submarine in Makin battle.
- 25. U.S. naval forces sank four Japanese destroyers in dawn battle northwest of Bougainville.
- 26. German stronghold of Gomel was captured by Russian troops. ¶ Sattelberg mission, last Japanese stronghold on Huon peninsula of New Guinea, was seized by Australian troops. ¶ Gen. Eisenhower revealed that he had denounced Gen. Patton for striking shell-shocked U.S. soldier, but upheld retention of Patton in his command on grounds that latter was valuable and loyal. ¶ Pres. Roosevelt, Prime Minister Churchill and Generalissimo Chiang Kai-shek completed five-day parley in Cairo and drafted specific program designed to (1) strip Japan of all its possessions gained after 1914, (2) restore to China all of its territory seized by Japan, (3) grant independence to Korea, (4) expel Japan from all territory acquired by "violence and greed" and (5) compel Japan to surrender unconditionally.
- 27. Declaration of state of belligerency between Colombia and Germany was approved by Colombian senate.
- 29. Japanese supply base of Bonga on northeastern New Guinea coast was occupied by Australian forces.
- 30. King Victor Emmanuel was shorn of his titles as king of Albania and emperor of Ethiopia by Badoglio government. ¶ Lt. Gen. Alexander A. Vandegrift was named to succeed Lt. Gen. Thomas Holcomb as commandant of U.S. marine corps.

DECEMBER, 1943

- 1. Pres. Roosevelt, Premier Stalin and Prime Minister Churchill completed four-day conference in Tehran on measures to destroy German military power and to set up postwar peace organization. § Moscow admitted retreating Russian armies had evacuated Korosten. § Swedish exchange liner "Gripsholm" arrived in New York with 1,439 Americans and Canadians released from Japanese internment camps.
- 2. Britain was urged by Prime Minister Jan Christiaan Smuts of South Africa to bolster its position in Europe lest it become a weak and unequal partner with U.S. and U.S.S.R. § 17 Allied ships were sunk and 1,000 casualties were suffered in surprise German air attack on Allied merchantmen in Italian port of Bari.
- 4. Yugoslav partisans announced they had set up provisional regime in opposition to Yugoslav government in exile sitting in Cairo. ¶ Bolivia's declaration of war against axis nations, approved Nov. 26, was formally announced. ¶ Two Japanese cruisers, 4 other ships and 72 planes were destroyed by U.S. task force in raid on Marshall Islands.

- 6. Turkey edged closer to United Nations as President Inonü conferred with Pres. Roosevelt and Prime Minister Churchill for three days in Cairo.
- 8. Wareo junction fell to Australian troops driving westward along New Guinea coast.
- 9. Chinese forces recaptured Changteh in vigorous counterattack and pressed drive to expel Japanese from "rice bowl" area. ¶ Znamenka, German-held rail centre southwest of Kremenchug, was captured by Russians. ¶ Senate overruled Director of Economic Stabilization Vinson and approved by 74-to-4 vote pay increase of 8 cents per hour for nonoperating railroad employees. ¶ Sec'y Hull announced that U.S. would aid Gen. Josep Brozovitch (Tito) and his Yugoslav partisan forces as well as Gen. Mikhailovitch.
- 10. Pres. Roosevelt signed bill placing pre-Pearl Harbor fathers at bottom of draft list.
- 12. German counteroffensive in Kiev area was halted by Russian troops. ¶ Russo-Czech treaty of friendship and mutual assistance was signed in Moscow.
- 14. Fall of Cherkassy to soviet troops was announced in Moscow communiqué.
- 15. U.S. forces landed at Arawe on New Britain Island in new Pacific offensive designed to neutralize Japanese air base of Rabaul.
- 16. British government announced that Prime Minister Churchill was ill of pneumonia, somewhere in middle east.
- 18. San Pietro in Fine fell to Allied 5th army in Italy after 72 hours of bitter battle.
- 20. New drive against German base of Vitebsk was opened by Russian armies, Moscow announced. ¶ Bolivian government of Pres. Peñaranda was overthrown in military coup and replaced by five-man junta.
- 21. U.S. army headquarters in Central Pacific disclosed that Gen. Marshall had toured Pacific battle areas and had conferred with Gen. MacArthur. ¶ Japanese air strip at Arawe was captured by troops of U.S. 6th army in New Britain, Allied communiqué announced. ¶ Pierre-Étienne Flandin, Marcel Peyrouton, Pierre Boisson and two other Frenchmen suspected of Vichyite tendencies were arrested on treason charges by French Committee of National Liberation.
- 22. Yugoslav partisan government forbade King Peter to return to homeland during war and deprived his government of all rights. ¶ Mgr. Bernard W. Griffin was appointed archbishop of Westminster. ¶ German foreign office hinted that reprisals would be taken against U.S. and British prisoners of war in Germany because Russians executed three German soldiers accused of wanton slayings.
- 23. Premier Raid Soli told Lebanese chamber of deputies that France had agreed to give up its mandated controls over Syria and Lebanon on Jan. 1, 1944.
- 24. Gen. Eisenhower was named to command Allied armies slated to invade western Europe; Lt. Gen. Spaatz was appointed over-all commander of U.S. strategic bombing air force operating against reich; Gen. Montgomery was appointed to lead British troops under Eisenhower; Gen. Sir Henry Maitland Wilson was picked to succeed Eisenhower as Allied commander in Mediterranean theatre of operations; and Gen. Alexander was named commander of all Allied forces in Italy. I Pres. Roosevelt declared in Christmas Eve broadcast that "Big Four"-U.S., Britain, U.S.S.R. and China-were agreed to use force "for as long as may be necessary," to maintain postwar peace. ¶ Pope Pius XII urged world leaders to shun hatred and vengeance and pleaded for just peace maintained by employment of force if necessary. I Gorodok, fortified town protecting German-held Vitebsk fell to advancing Russians.

- 25. German supply route linking Vitebsk and Polotsk was cut by Russian armies.
- 26. 26,000-ton German battleship "Scharnhorst" was sunk off North Cape, Norway, after running battle with British warships.
- 27. 15,000 Germans were killed as Russia's 1st Ukrainian army rolled back nazi forces 25 mi. on a front 50 mi. wide, Moscow communiqué announced. ¶ Appointment of Air Chief Marshal Sir Arthur Tedder as deputy supreme commander of Allied invasion army under Gen. Eisenhower was announced by British government, which also revealed that Gen. Sir Bernard Paget had been named commander in chief in middle east under Gen. Sir Henry Maitland Wilson.
- 28. Majority of 170,000 striking steelworkers returned to jobs after WLB approved Pres. Roosevelt's suggestions that retroactive pay be guaranteed. ¶ Maj. Gen. Doolittle was named to command U.S. 8th air force in England; Lt. Gen. Devers was appointed commander of all U.S. forces in Mediterranean; Lt. Gen. Eaker was named to command all Allied air forces in Mediterranean and Gen. Nathan F. Twining was named commander of U.S. 15th air force in Mediterranean.
- 29. Korosten, Ukraine rail hub, was recaptured by Gen. Nikolai Vatutin's 1st Ukrainian army. ¶ Canadians occupied Ortona in Italy after nine days of house-to-house fighting. ¶ Scheduled walkout of U.S. railway workers averted as last of three brotherhoods cancelled strike orders.
- 30. Russian armies in Ukraine routed 22 German divisions and swarmed through broken nazi lines on 186-mi. front. ¶ Cape Gloucester aerodrome on New Britain Island fell to U.S. marines who captured both of Japanese-held landing strips after 48-hr. battle.
- 31. Zhitomir was recaptured by Russian armies in powerful drive toward Polish frontier. ¶ Adolf Hitler warned that there would be "no victors or losers, but merely survivors and annihilated" in World War II. ¶ All political parties in Argentina were ordered dissolved by government decree.

JANUARY, 1944

- 1. Continuance of co-operation among United Nations in postwar era to fight disease, malnutrition and unemployment was urged by Pres. Roosevelt.
- 2. Landing of U.S. 6th army troops at Saidor perilled Japanese base of Madang on New Guinea.
- 3. Gen. Henry H. Arnold said Allied air forces intended to knock out luftwaffe in order to make Allied invasion of western Europe as cheap as possible.
- 4. Moscow communiqué disclosed that Gen. Nikolai Vatutin's 1st Ukrainian army had crossed prewar Russo-Polish frontier. ¶ Nazi defense base of Belaya Tserkov fell to Russian armies.
- 5. Red army units in western Ukraine captured Berdichev. ¶ Polish government in London announced that underground forces in Poland proper were instructed not to impede Russian advance into their country. ¶ Lt. Gen. Sir Oliver Leese succeeded Gen. Montgomery as commander of British 8th army in Italy.
- 6. Union of Polish Patriots in Moscow called on Polish underground to rise immediately against nazi forces.
- 8. Kirovograd, Ukraine rail hub, was occupied by Gen Ivan S. Konev's 2nd Ukrainian army.
- 9. National committee of U.S. Communist party recommended dissolution of party as political group. ¶ Appoint-

ment of Maj. Gen. Walter Bedell Smith as chief of staff to Gen. Eisenhower was announced by war department in Washington.

- 11. Soviet union offered to guarantee "strong and independent" Poland provided latter country agreed to accept Curzon line as eastern boundary. ¶ Count Galeazzo Ciano, Marshal Emilio de Bono and three other leading Italian fascists were executed by firing squad after their conviction by neo-fascist revolutionary tribunal.
- 13. Pres. Roosevelt submitted budget of \$99,769,000,000 to congress for fiscal year 1944-45.
- 14. Polish government-in-exile offered to discuss all problems with soviet union if U.S. and Great Britain would act as intermediaries.
- 16. Arrival of Gen. Eisenhower in London to take over duties as commander of Allied invasion armies was announced.
- 17. Russia rejected Poland's counteroffer to settle boundary dispute and refused to renew diplomatic relations with Polish government-in-exile. ¶ Lt. Gen. Omar N. Bradley was named senior ground commander of U.S. troops in Great Britain.
- 18. Moscow disclosed Russians had opened new offensive in Leningrad area, smashing nazi defenses at near-by Oranienbaum.
- 19. Sec'y Stimson returned railways to owners after Pres. Roosevelt announced final settlement of wage dispute.
- 20. Novgorod fell to Russian armies driving toward Baltic.
- 21. Premier Tojo admitted there was only "hair's breadth between final victory and defeat" in Pacific war.
- 22. British and U.S. troops landed on west coast of Italy, 30 mi. below Rome, and captured port of Anzio.
 ¶ Robert E. Hannegan was elected chairman of Democratic party, succeeding Postmaster Gen'l Frank C. Walker.
- 23. Maj. Gen. John C. H. Lee of U.S. army was named deputy commander to Gen. Eisenhower.
- 24. U.S. state department announced it would not recognize new revolutionary regime in Bolivia.
- 25. George N. Briggs, suspended assistant to Sec'y Ickes, was indicted by federal grand jury on charge of forging famed "Harry Hopkins letter."

26. Argentina ruptured diplomatic relations with Germany and Japan. ¶ Moscow rejected U.S. offer to mediate Russo-Polish boundary dispute, Sec'y Hull disclosed.

- 27. Joint army-navy communiqué disclosed that Japanese tortured, starved or murdered 5,200 U.S. soldiers and many more Filipino troops taken after fall of Bataan and Corregidor. ¶ U.S. and British forces defeated crack nazi panzer units southwest of Littoria as fighting at Anzio area developed in intensity. ¶ Washington dispatches said U.S. had suspended shipments of oil from Caribbean area to Spain.
- 28. Foreign Sec'y Eden said that thousands of British prisoners were tortured in Japanese concentration camps. ¶ Lt. Gen. Mark Clark issued order prohibiting attacks on church property in Italy.
- 29. Red army column occupied town of Novosokolniki in drive 230 mi. south of Leningrad. ¶ 45,000-ton "U.S.S. Missouri," was launched at Brooklyn navy yard.
- 30. In desperate effort to rally support for antibolshevist "crusade," Hitler warned that Russian victory would mean destruction of Europe while nazi victory would mean its preservation.
 - 31. U.S. forces invaded Marshall Islands, naval com-

muniqué announced; 7th infantry division landed near Kwajalein Islands and 4th marine division established beachhead near Roi Island.

FEBRUARY, 1944

- 1. Supreme soviet gave unanimous endorsement to Foreign Commissar Molotov's proposal to alter constitution, enabling each of 16 constituent republics to create own army formations and have separate diplomatic representation abroad. ¶ U.S. troops pushed into outskirts of Cisterna in drive toward Rome.
- 2. Roi Island in northern part of Kwajalein atoll was captured by U.S. marines, thus becoming first prewar Japanese territory seized by U.S. forces, naval communiqué disclosed. ¶ Red army columns crossed prewar Estonian border and pushed toward rail town of Narva.
- 3. House of representatives defeated administrationsponsored federal ballot for soldier vote and approved measure designed to leave service balloting to states. ¶ Franco cabinet ratified policy of strict neutrality and warned Spain would resist all pressure to deviate from this course.
- 4. Allied line at Anzio beachhead bent back under weight of four powerful German counterattacks. ¶ U.S. warships, attacking Japanese home territory for first time, shelled Paramoshiri Island in Kuriles group; U.S. forces invaded three more islands in Marshalls group, naval communiqué revealed.
- 5. Gen. Vatutin's 1st Ukrainian army smashed deep into Poland on 65-mi. front, capturing Rowne and Luck, Moscow revealed. ¶ Plans for construction of 1,200-mi. pipe line from Persian gulf area to Mediterranean were revealed by Sec'y Ickes.
- 6. U.S. occupation of virtually all Kwajalein atoll was announced in naval communiqué. ¶ Ukraine soviet republic, first of soviet republics to set up own foreign office, moved to make treaty with "new Poland."
- 8. Gen. Rodion Y. Malinovsky's 3rd Ukrainian army battered nazi force of 75,000 men and won back manganese centre of Nikopol.
- 10. U.S. and Australian troops effected junction near Saidor in New Guinea after gruelling 18-week campaign, winning control of Huon gulf. ¶ Abrupt suspension of secret Anglo-Turkish general staff talks was disclosed in Ankara.
- 11. Vice-Adm. John H. Towers was named deputy commander in chief of Pacific ocean area while Vice Adm. John H. Newton was appointed deputy commander of the South Pacific force.
- 12. Russo-Polish border dispute became more intense when pro-soviet Union of Polish Patriots announced it had already organized national council on Polish soil.
- 13. Soviet troops freed virtually all of east shore of Lake Peipus in rapid five-day advance.
- 14. Green (Nissan) Islands, 250 miles S.E. of Kavieng, New Ireland, were occupied by U.S. and Australian troops. ¶ Wendell Willkie announced he would be candidate for Republican presidential nomination.
- 15. Ancient Benedictine monastery of Monte Cassino was blasted by 226 Allied bombers in eight separate attacks; Pres. Roosevelt said bombing of historic shrine was necessary because Germans were using it as lookout post and had emplaced artillery within its walls.
- 16. U.S. bombers sank 15 ships in Japanese convoy bound for Bismarck archipelago.
- 17. U.S. carrier-borne planes, supported by huge fleet of surface vessels, delivered smashing blow against Japanese-held Truk Island, sinking 23 ships, destroying 201

planes, in two-day attack. ¶ Gen. Konev's 2nd Ukrainian army liquidated 10 German divisions trapped in Cherkassy pocket, killing at least 52,000 of foe and capturing 11,000 more, Stalin announced.

18. Pres. Roosevelt vetoed anti-subsidy legislation and house of representatives failed to override veto.

19. U.S. troops invaded Eniwetok Island; Engebi air base on northern part of Eniwetok atoll was captured by U.S. marines, naval communiqué disclosed.

20. Second Japanese convoy in week that tried to escape from Rabaul was intercepted by Allied airmen, who sank

9 ships in 48 hours of battle.

21. Heavy Japanese losses at Truk, officially admitted by Tokyo, resulted in drastic shake-up of war lords with Adm. Shigetaro Shimada replacing Adm. Osami Nagano as navy chief of staff; Premier Tojo himself assumed post of army chief of staff, replacing Marshal Gen. Sugiyama.

22. Krivoi Rog, Ukrainian steel centre and rail hub, was occupied by Gen. Malinovsky's 3rd Ukrainian army.

23. Foreign Secretary Eden told commons that Britain reserved right to intervene in any part of Europe to preserve peace, but denied London had agreed to setting up of spheres of influence on continent.

24. House of representatives overrode Pres. Roosevelt's veto to approve tax bill by 299-to-95 vote; Senator Barkley resigned as majority leader but was re-elected unanimously by senate democrats.

25. Tax bill became law after senate followed lead of house of representatives and overrode presidential veto

to approve measure by 72-to-14 vote.

26. Immediate review of occupational draft deferments of 5,000,000 men was ordered by Pres. Roosevelt in move to help armed forces make up deficiency of 200,000 men.

28. Allied command in New Delhi announced that Allied troops annihilated Japanese task force of 8,000 men in two weeks of heavy fighting in Arakan, Burma.

29. U.S. army forces under Gen. MacArthur landed on Los Negros Island in Admiralty group and seized Momote airstrip. ¶ Soviet union revealed it had offered peace to Finland on condition that latter break with reich, withdraw Finn troops to 1940 border and help Red army intern nazi forces in Finland.

MARCH, 1944

1. Soviet communiqué announced that Col. Gen. Leonid Govorov's troops had forced the Narva river and had cut the Narva-Tallinn railway.

2. London dispatch said Britain had halted shipment

of all military supplies to Turkey.

3. Pres. Roosevelt disclosed that Italian fleet would be distributed equally among U.S., Britain and Russia.

4. Berlin was bombed for first time by big U.S. bombers.

- 5. Appointment of Marshal Gregory K. Zhukov as commander of soviet forces on 1st Ukrainian front, replacing Gen. Nikolai Vatutin, was revealed. J U.S. amphibious forces landed 30 mi. beyond Saidor on New Guinea coast.
- 6. U.S. veterans of Solomons campaigns under Lt. Gen. Joseph Stilwell opened drive on Burma front and cut off Japanese line of retreat in Hukawng valley, Allied communiqué said.

8. Nearly 80,000 miners laid down tools in South Wales pits as coal strike spread rapidly in Britain.

10. Prime Minister de Valera rejected U.S. request that Eire government oust German and Japanese diplomats. ¶ New Russian offensive in Ukraine launched by Marshal Ivan S. Konev resulted in capture of Uman and brought death to 20,000 nazi troops. ¶ Landing of 1,500 Anglo-American commando troops on Dalmatian island of Lissa

was reported by Berlin radio. ¶ Gen. Edelmiro Farrell became president of Argentina after Gen. Pedro Ramírez formally resigned.

11. 1,000 Japanese troops were slain in desperate attack against U.S. positions at Empress Augusta bay on Bougain-

12. All travel between Britain and Ireland was suspended indefinitely by British home office in move to conceal invasion manoeuvres. ¶ Adolf Hitler failed to attend annual Heroes' day ceremony in reich. ¶ Pope Pius XII made new appeal to belligerents not to turn Rome into battlefield.

13. Black sea port of Kherson fell to soviet armies in lower Ukraine.

15. U.S. army troops landed on Manus, largest of Admiralty Islands, and laid siege to Japanese-held Lorengai airfield.

17. Sec'y Hull disclosed Moscow did not consult with Washington when it announced intention to recognize Badoglio regime. I Vienna was bombed for first time by U.S. aircraft. ¶ British and Indian troops were landed by U.S. glider and transport planes 150 mi. behind Japanese lines in north central Burma, Allied communiqué revealed.

18. U.S. troops wiped out last Japanese resistance on Manus Island to complete occupation of Admiralty group.

19. Russians cleared nazi troops from 62-mi. stretch of Dniester river, captured Mogilev-Podolsk and surged into Bessarabia. ¶ Major offensive against Imphal, capital of Manipur state in India, was opened by Japanese troops, Allied communiqué disclosed. ¶ Lt. Gen. Stilwell's Chinese and U.S. forces conquered Hukawng valley and started drive against retreating Japanese in Mogaung valley in

20. Hitler's wehrmacht occupied Hungary in swift move to stiffen backbone of faltering axis state. ¶ Pierre Pucheu, former Vichy interior minister, was found guilty of treason by Algiers military court and was executed by firing squad. ¶ U.S. marines by-passed Japanese base at Kavieng and occupied Emirau Island while U.S. warships hurled 1,000 tons of shells into Kavieng. J Lt. Gen. H. D. G. Crerar was appointed commander of 1st Canadian army in Eng-

21. Finland rejected Russian peace offer and Moscow statement put full blame on Helsinki. ¶ Maj. Gen. Alexander M. Patch was put in command of U.S. 7th army replacing Lt. Gen. George S. Patton, Jr.

23. Bold Japanese thrust into Manipur valley of India put enemy within 25 mi. of Imphal, key road centre. ¶ British authorities placed rigid curfew on Jewish sections of chief Palestine cities after Jewish terrorists killed at least 6 policemen.

25. Dispatches from Italian front indicated that Allied drive to take Cassino ended in failure.

- 26. Russian troops of Marshal Konev's 2nd Ukrainian front drove across Prut river into Rumania proper. ¶ Prime Minister Churchill in world-wide broadcast said Russian victories were main cause of "approaching downfall" of
- 27. Underground leaders in Poland were ordered by Polish government-in-exile to co-operate with soviet troops in military operations, Polish Telegraph agency said. ¶ Supreme court ruled that portal-to-portal wage must be paid to miners under Fair Labor Standards act; government's authority to control prices during wartime was affirmed in two supreme court decisions.
 - 28. Nikolayev, Black sea naval base, was recaptured by

Russian troops. J Left-wing elements won control of American Labor party in New York state primary elections.

29. War and navy departments endorsed plan to draft men classified as 4-F for essential civilian work. ¶ U.S. naval forces attacked Palau Islands, 550 mi. due E. of Philippines.

30. House of commons erased, 117 to 116, vote against Churchill on question of equal pay for women teachers by approving government's general conduct by vote of 425 to 23, after Churchill demanded vote of confidence.

31. Soviet union renewed fisheries pact with Japan but announced that Tokyo agreed to liquidate immediately all its coal and oil concessions on Russian-owned half of Sakhalin Island. ¶ Pres. Roosevelt allowed State Right's voting bill for servicemen to become law without his signature, but urged congress to provide changes to facilitate balloting by soldiers. ¶ U.S. Pacific task force sank 28 Japanese ships, damaged 18 others and destroyed or damaged 214 planes in 72-hr. sea and air attack on Palau, Yap, Ulithi and Woleai.

APRIL, 1944

- 1. U.S. planes bombed Swiss town of Schaffhausen by mistake, killing at least 50 persons and wounding 150.
- 2. Soviet Foreign Commissar Molotov announced, after Russian troops had entered Rumania proper, that U.S.S.R. would neither seek territory nor change Rumania's social structure. ¶ Moscow radio hinted that recurrence of raids by Chungking forces into territory of Mongolian People's republic would lead to severe retaliation by soviet union
- 3. Occupation by U.S. troops of ten more atolls in Marshall Islands was announced by Pacific fleet head-quarters. ¶ Supreme court ruled that Negroes might vote in Texas primary, reversing earlier verdict established in 1935.
- 4. Col. J. Monroe Johnson was appointed director of Office of Defense Transportation, succeeding late Joseph B. Eastman.
- 5. Wendell Willkie withdrew as candidate for G.O.P. presidential nomination after defeat in Wisconsin primaries. § Britain cut all phone connections with Ireland in move to prevent "invasion leaks."
- 6. Montague Norman resigned as governor of Bank of England and Lord Catto was slated to succeed him.
- 7. Japanese troops in India drove across Imphal-Kohima highway and threatened lifeline of Lt. Gen. Stilwell's forces in Burmese jungles, Allied communiqué announced.
- 8. Gen. Hershey, selective service director, ordered temporary halt in induction of men over 26 until available men under that age had been absorbed into armed forces.
- 10. Black sea port of Odessa was recaptured by Russian armies. ¶ Florida "peonage" law under which Negro labourer was jailed for failure to pay court fine was ruled unconstitutional by U.S. supreme court.
- 12. King Victor Emmanuel announced that he would retire from public life in favour of his son, Crown Prince Umberto, as soon as Allies entered Rome. ¶ Capt. Richard Ira Bong shot down 27th enemy plane, breaking Rickenbacker's record of 26 established during World War I.
- 13. Stockholm cabinet disclosed it had received note from U.S. and Britain requesting Sweden to halt sale of ball bearings to Germany. ¶ German resistance in Crimea crumbled as soviet troops captured Crimean capital of

Simferopol and ports of Yevpatoriya and Feodosiya.

- 14. Proposal that government-built war plants be turned over to veterans as postwar "bonus payment" was made by Sec'y Ickes. ¶ Removal of Gen. Giraud as commander in chief of French army was ordered by French Committee of National Liberation, which placed him on reserve list.
 - 16. Crimean port of Yalta was captured by Russians.
- 17. Great Britain banned travel by all foreign diplomats (except those of U.S. and Russia) assigned to posts in England and prohibited foreign diplomatic corps from using code messages in move to prevent leakage of invasion news. ¶ Government of Marshal Badoglio resigned and was instructed by King Victor Emmanuel III to reform on broader basis.
- 19. Allied communiqué said British and Indian troops broke through Japanese road blocks and lifted siege of Kohima.
- 21. Turkish foreign ministry announced halting of all chrome exports to Germany. ¶ Marshal Badoglio formed new cabinet with self as premier and foreign minister and with representatives of major Italian opposition parties holding key posts. ¶ Prime Minister Churchill assured commons that Atlantic charter did not threaten existence of British empire.
- 22. Large force of U.S. troops were landed at Hollandia in Netherland New Guinea and Aitape in northeastern New Guinea.
- 23. Three-week mutiny aboard three Greek ships anchored near Alexandria was quelled by loyal Greek officers and men, British communiqué said. ¶ Hungarian national council headed by Count Michael Karolyi was established in London.
- 24. Australian forces entered Madang in British New Guinea. ¶ New drive into Anhwei province, China, was launched by Japanese.
- 25. Unification of all U.S. armed forces under single command was advocated by Sec'y Stimson.
- 26. U.S. troops took possession of Montgomery Ward plant in Chicago after Chairman Sewell Avery refused to obey WLB order to extend expired contract with C.I.O. and challenged Pres. Roosevelt's authority to seize company. ¶ Argentine government closed down La Prensa, Buenos Aires newspaper, for "offending" cabinet. ¶ New Guinea port of Alexishafen was occupied by Australians.
- 27. Largest Hollandia aerodrome fell to U.S. troops, thus ending campaign for this area in six days. ¶ Federal court granted injunction to government restraining Montgomery Ward officials from interfering with federal operation of plant; Chairman Sewell Avery was carried out bodily by troopers after he refused to leave his offices.
- 28. Abortive revolt against Villarroel regime was quickly quelled by Bolivian authorities, according to La Paz announcement.
- 29. U.S. army troops withdrew from Montgomery Ward plant.
- 30. Gen. MacArthur declared that he neither desired nor would accept nomination for president. ¶ Marshal Tito told reporter that his adherents wanted not only material help from Allies but full recognition of his partisan regime as government of Yugoslavia as well. ¶ Canol oil refinery, \$130,000,000 U.S.-built project in northwest Canada, was officially opened.

MAY, 1944

- 1. Conference among premiers of Great Britain and dominions opened, with agreement on policy of general security as one of principal topics on agenda.
 - 3. Production of synthetic quinine by two young Har-

vard chemists, Dr. Robert B. Woodward and Dr. William E. Doering, was announced in Cambridge, Mass. ¶ OPA freed all meat, except steaks and choice cuts of roast beef, from ration points.

5. Allied bombers breached Pescara dam on Italy's Adriatic coast, loosing floodwaters toward Adriatic hinge of German line. India office announced unconditional release of Mohandas K. Gandhi.

6. U.S. state department blacklisted 38 Eire firms and businessmen.

7. Gen. de Gaulle said in Tunis speech that France desired permanent alliance with "dear and powerful Russia.'

8. Japanese forces were repulsed with heavy losses in Manipur hills in eastern India, Adm. Mountbatten's headquarters disclosed. ¶ Pullman, Inc., was ordered by federal court to separate "completely and perpetually" its railroad car building business from its sleeping car enterprises. I Senate followed house's lead and voted to extend lendlease bill for another year.

9. Sevastopol was recaptured by Russian forces. ¶ U.S. government returned Montgomery Ward plant in Chicago to proprietors as company's employees voted 2,340 to

1,565 for C.I.O. as collective bargaining unit.

10. James V. Forrestal was appointed secretary of navy by Pres. Roosevelt. ¶ 20,000 Chinese troops opened push to free Burma road from Japanese control and crossed Salween river on 100-mi. front.

11. Allied forces opened new offensive in Italy with smashing air and artillery bombardment of German Gustav line.

12. Chungking communiqué acknowledged that Japanese troops won complete control of Peiping-Hankow railway.

13. New Allied drive against Japanese bases at Mogaung and Myitkyina was launched by forces under Lt. Gen. Stilwell, Allied communiqué announced. ¶ Father Orlemanski was suspended and disciplined by Catholic Church authorities, presumably for making trip to Russia and "treating with communists."

16. U.S., Britain and Russia signed agreements with exiled regimes of Norway, Netherlands and Belgium regarding control of civilian affairs during liberation period.

17. Chinese-American force under Brig. Gen. Frank

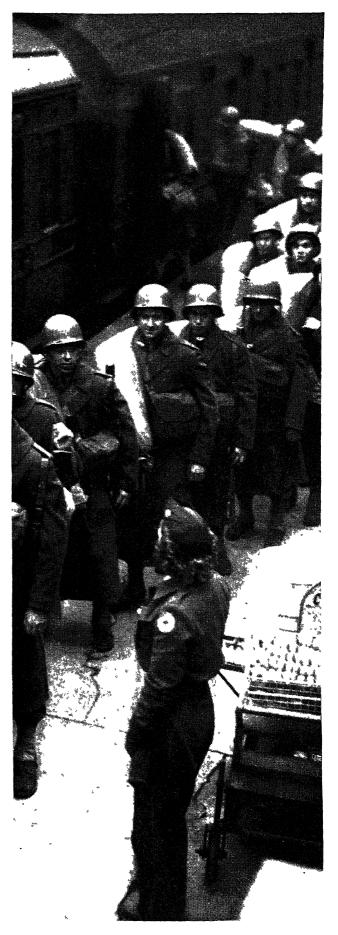
Merrill captured Myitkyina aerodrome.

18. German-held stronghold of Cassino and Tyrrhenian seaport of Formia fell to advancing U.S. troops in Italy. ¶ Appointment of Marshal Karl von Rundstedt as supreme commander of German troops in western Europe was announced by reich news agency.

19. Nazi Gustav line was cracked by U.S. and French troops and Gaeta was occupied by Allies as nazis retreated toward Rome. ¶ U.S. troops completed occupation of Wakde Islands, annihilating Japanese garrison.

20. Gen. Eisenhower asked resistance groups in occupied Europe to help secure information on German military movements in first of broadcast "operational orders" to underground. ¶ Gen. Mikhailovitch was dropped by Yugoslav government-in-exile as minister of war, King Peter announced. ¶ U.S. Communist party voluntarily decreed its own dissolution and its leaders organized nonparty organization to work for "more democratic and progressive America." ¶ New Liberal party convening in New York nominated Pres. Roosevelt and Vice-President Wallace.

U.S. troops, newly arrived in England, entraining for temporary quarters prior to the invasion of Europe on D-day, 1944. Red Cross worker (foreground) stood by with coffee and doughnuts



21. Alexei, metropolitan of Leningrad and Moscow, was elected acting patriarch of all Russia by Holy Synod of Russian Orthodox Church.

22. Prime Minister Per Albin Hansson acknowledged that Sweden had not succeeded in observing strict neu-

trality in all respects.

25. Allied 5th army's beachhead at Anzio was linked with main Italian front. § 2,500 heavy bombers, 1,200 medium bombers and hundreds of fighter planes from all five Allied air commands in Europe struck smashing blows at rail yards and airfields in France and Belgium.

27. Japanese-held Biak Island off coast of northwestern New Guinea was invaded by U.S. infantrymen under Gen.

MacArthur's command.

29. Military junta seized power in Guayaquil, Ecuador, forcing resignation of Pres. Carlos Arroyo del Rio and his cabinet.

JUNE, 1944

- 1. Ivan Bagrianoff formed new Bulgar cabinet, Swiss sources disclosed.
- 2. U.S. bombers staged first shuttle raid to new bases in soviet union, bombing Rumanian targets on way. ¶ Dr. Ramon Grau San Martin was elected president of Cuba.

4. Allied 5th army captured Rome.

- 5. Victor Emmanuel III relinquished his authority as ruler of Italy to Crown Prince Umberto, but retained his title as head of house of Savoy. ¶ U.S. supreme court ruled that insurance companies were engaged in interstate commerce and subject to Sherman antitrust law.
- 6. Allied invasion of western Europe was launched with landings by U.S., British and Canadian troops on northern tip of Normandy peninsula; more than 31,000 Allied airmen flew 7,500 sorties in 32-hr. period to hammer out invasion path. ¶ Disclosure that Portugal had agreed to halt all shipments of wolfram to Germany was made by Edward R. Stettinius, Jr., U.S. undersec'y of state. ¶ Chinese forces in Salween area of Burma cut all sections of Burma road available to Japanese transportation.
- 7. Allied armies won beachheads five to ten mi. deep in Normandy and captured town of Bayeux, Allied communiqué said. ¶ Mokmer airfield was taken by Allied armies 11 days after their landing on Biak Island.
- 9. Gen. Marshall, Adm. King and Gen. Arnold arrived in London for invasion conferences with British military leaders. ¶ Pres. Roosevelt agreed to receive Gen. de Gaulle in Washington for conversations on military and civil matters pertaining to France. ¶ Ivanoe Bonomi became premier of Italy and also assumed portfolios of interior and foreign affairs in new cabinet. ¶ Allied 5th army troops captured Tuscania.
- 11. Opening of new soviet offensive against German-Finnish troops in the Karelian isthmus was announced in Moscow. ¶ German forces in Adriatic sector of Italy abandoned Pescara, Chieti and Sulmona, and British 8th army captured Avezzano, 48 mi. E. of Rome.
- 12. Pres. Roosevelt asserted that policy of smashing Germany first would speed up conquest of Japan.
- 13. Capture of Carentan by Allies in Normandy was announced in Allied communiqué. ¶ Allied landings in France were extolled by Premier Stalin as "brilliant success" and "masterly in execution."
- 14. Allied and German tank columns battled furiously as Marshal Rommel launched strong counterattacks south of Bayeux. ¶ Saipan Island in Japanese-held Marianas group was invaded by U.S. troops.

15. England was attacked for first time by pilotless robot bombs launched from platforms in Pas-de-Calais area. ¶ Giant B-29 superfortresses in first raid on Japan bombed steel mills at Yawata; four were lost in mission. ¶ Turkish premier Shukru Saracoglu assumed post of foreign minister after resignation of Numan Menemencioglu, and banned passage of armed ships through Straits of Dardanelles.

16. Lt. Gen. Omar Bradley's troops captured St.-Sauveur-le-Vicomte in drive across neck of Cherbourg peninsula. ¶ Hjalmar J. Procope, Finnish minister, and three counsellors of his legation were ordered to leave U.S. for activities "inimical to our interests." ¶ Allied troops in Italy advancing toward the German "Pisa-Florence-Rimini" defense line, made 25-mi. drive in single day. ¶ Island of Elba was invaded by French commandos and colonial troops under Gen. Jean de Lattre de Tassigny.

17. F.F.I. (French Forces of the Interior) were praised in special communiqué by Gen. Eisenhower for disrupting German transport and communications and for direct attacks on German garrisons in France. ¶ Appointment of Adm. William S. Halsey to command of U.S. grd fleet was announced by Adm. Nimitz. ¶ U.S. 9th infantry division cut across Cotentin peninsula, reached its west coast in Barneville-sur-Mer region and trapped sizable German garrison in Cherbourg area.

18. Marshal Tito and Dr. Ivan Subasitch, prime minister of Yugoslav government-in-exile, held three-day conference (June 14-17) in liberated Yugoslav territory and reached agreement "regarding many questions," Yugoslav press agency asserted. ¶ Ancient Italian town of Assisi was

occupied by British 8th army.

- 19. German garrison at Elba surrendered to French colonial troops. ¶ Formidable Japanese sea force was repulsed with losses of four ships sunk and ten badly damaged in battle with Task Force 58 of U.S. Pacific fleet off Philippines.
- 20. Viipuri was captured by Marshal Leonid A. Govorov's Russian troops on 11th day of their offensive against Finland.
- 21. Hunan, capital of Changsha, was captured by Japanese, Chungking admitted.
- 22. "G.I. Bill of Rights"—measure authorizing broad program of benefits for veterans of World War II—was signed by Pres. Roosevelt.
- 23. Russian armies opened 1944 summer offensive with heavy attacks against Germans along 300-mi. line. ¶ U.S. recognized Villarroel government of Bolivia.
- 24. Furious battle raged for Cherbourg as Gen. Bradley's U.S. troops assaulted German defenses 2,000 yd. from centre of city.
- 25. Adm. Nimitz disclosed that in Marianas fighting, June 10–23, U.S. forces sank 30 Japanese ships and destroyed 747 Japanese planes as against losses of 4 U.S. ships damaged and 151 planes destroyed.

26. Vitebsk and Zhlobin, anchors of nazi "Fatherland line" in Russia, were captured by Red army. ¶ Lt. Gen. Stilwell's troops captured important railway town of Mogaung in North Burma.

- 27. Capture of Cherbourg was disclosed in special communiqué from supreme Allied headquarters. ¶ Swedish dispatches said German troops had marched into Helsinki. ¶ U.S.-Argentine relations worsened as Washington instructed Norman Armour, U.S. ambassador in Buenos Aires, to return "immediately for consultation."
- 28. Thomas E. Dewey was named candidate for president and John W. Bricker candidate for vice-president by Republican convention in Chicago. ¶ Japanese armies launched general offensive from Canton area to establish

29. Gen. Marshall, Adm. King and Gen. Arnold, in joint report from chiefs of staff to Pres. Roosevelt, warned U.S. "home-front" against over-optimism and slackening of production.

30. U.S. severed diplomatic relations with Finland, charging that Helsinki government was allied with Germany. ¶ Danish revolt against nazi curfew orders resulted in Copenhagen general strike which paralyzed city, Stockholm dispatches said. ¶ Herbert Brownell, Jr., was elected chairman of Republican national committee.

JULY, 1944

- 1. War Manpower commission's plan to solve manpower shortage by channelling hiring of all male labour through U.S. employment service went into effect. ¶ DNB broadcast said Hitler admitted German situation was difficult, but voiced confidence that "national fanaticism" would bring victory.
- 2. Gen. Jorge Ubico resigned as president of Guatemala after week of threatened revolt, and turned over government to military junta.
- 3. Siena fell to U.S. and French forces driving on Florence. ¶ Ancient White Russian capital of Minsk was captured by Russian troops on 11th day of offensive toward Warsaw. ¶ U.S. 1st army launched heavy offensive against German lines defending La Haye-du-Puits, a southwestern base of Cherbourg peninsula. ¶ Plan for establishing \$10,000,000,000 world bank for reconstruction which would "guarantee" international loans was called sound contribution to postwar peace by Lord Keynes, chairman of British delegation to United Nations monetary parley.
- 4. Russian troops of Gen. Ivan C. Bagramyan's 1st Baltic army captured Polotsk, gateway to Baltic.
- 6. Churchill disclosed that London was principal target of German robot bombs and said that 2,752 persons were killed and about 8,000 others seriously wounded in first three weeks of robot blitz. ¶ Gen. Charles de Gaulle arrived in U.S. and conferred with Pres. Roosevelt in White House. ¶ German broadcast disclosed that Field Marshal Guenther von Kluge was made German supreme commander in western Europe, succeeding Field Marshal von Rundstedt, who was relieved "because of ill health."
- 7. New Yugoslav cabinet was formed by Premier Ivan Subasitch, who gave portfolios of agriculture and justice-communications to two Tito followers.
- 8. Occupation of Saipan was completed by U.S. forces, who were mopping up scattered enemy remnants.
- 9. Caen was taken by British and Canadian forces while La Haye-du-Puits was captured by U.S. troops in France.
- 11. Pres. Roosevelt announced he would run for fourth term if nominated by Democratic national convention. § French Committee of National Liberation was recognized by Pres. Roosevelt as de facto political authority in liberated areas.
- 13. Vilna, capital of Lithuania, was captured by Russian troops. ¶ D. Basil O'Connor was named chairman of American Red Cross by Pres. Roosevelt.
- 14. Italian communications centre of Poggibonsi was captured by French troops. ¶ Lt. Gen. Ben Lear was named commander of U.S. army ground forces, succeeding Lt. Gen. Lesley J. McNair.
- 15. Delegates to United Nations Monetary conference adopted table of quotas for proposed international monetary fund which would aggregate \$8,800,000,000.
- 16. Two soviet armies captured fortress city of Grodno, 45 mi. from frontier of East Prussia.
 - 17. British 8th army troops crossed Arno river in sur-

prise dash toward Florence. ¶ Marshal Konstantin Rokossovsky's 1st White Russian army swept toward Warsaw and reached Curzon line, while Gen. Andrei I. Yeremenko's 2nd Baltic army to north crossed into Latvia. ¶ Japanese cabinet shakeup resulted in ouster of Adm. Shigetaro Shimada as navy minister and his replacement by Adm. Naokuni Nomura.

- 18. German defenses below Caen were ripped open by British 2nd army in start of major offensive. ¶ Marshal Ivan S. Konev's 1st Ukrainian army opened new offensive aimed at heart of Germany, driving 31 mi. in three days and crossing Bug river at 1941 Soviet-Polish frontier, Moscow announced. ¶ Premier Hideki Tojo was ousted as chief of Japanese army staff; Gen. Yoshijiro Umezu was appointed his successor.
- 20. Franklin D. Roosevelt was renominated for 4th term by vote of 1,086 to 90 at Democratic national convention in Chicago. ¶ Democratic convention adopted platform calling for U.S. participation with United Nations in world organization. ¶ After attempt on his life, Hitler overhauled general staff, named Col. Gen. Heinz Guderian as chief of staff and revealed that Heinrich Himmler had been put in charge of home-front army. ¶ U.S. assault forces invaded Guam and established substantial beachheads. ¶ Failure of Japanese efforts to stem U.S. drive in Pacific compelled resignation of Gen. Hideki Tojo as premier.
- 21. Sen. Harry S. Truman was nominated as Democratic candidate for vice-president.
- 22. Gen. Kuniaki Koiso was named Japanese premier; Adm. Mitsumasa Yonai was appointed navy minister and Field Marshal Gen. Sugiyama was made war minister.
- 23. Establishment of Polish Committee of National Liberation to administer areas of Poland freed by Red army was announced by Moscow radio. ¶ Prime Minister Churchill detected "grave signs of weakness" in reich and predicted war might come to end earlier than had been foreseen.
- 24. New Russian-sponsored Polish Committee of National Liberation was denounced in London by spokesman for exiled Polish government.
- 25. Adolf Hitler decreed total mobilization of reich and occupied territories, appointed Joseph Goebbels "Reich Plenipotentiary for Total War Effort" and gave Marshal Goering task of adjusting public life to necessities of total war. ¶ Director Bradley Dewey of U.S. Office of Rubber Director announced that U.S. synthetic rubber industry had created adequate rubber reserve for U.S. needs and that he would surrender voluntarily his emergency powers effective as of Sept. 1.
- 26. U.S. forces scored major breakthrough of German lines in Normandy in plunge south toward Coutances.
 ¶ Red army captured Deblin and reached east bank of Vistula river in force. ¶ U.S. state department document accused Argentina of giving assistance to axis, and recommended continued nonrecognition of Pres. Farrell's regime.
- 27. U.S. sovereignty over island of Guam was re-established by proclamation of Adm. Nimitz.
- 28. Brest-Litovsk, Jaroslaw and Przemysl were captured by Russian troops.
- 29. Germans withdrew entire west wing of armies in Normandy. ¶ U.S. B-29 Superfortresses staged first daylight blow against Japanese-controlled territory, bombing Anshan and Tangku (port of Tientsin) in Manchuria. ¶ Pres. Roosevelt returned from Pearl Harbor conference with Adm. Nimitz, Gen. MacArthur and Adm. Halsey.



30. Allied armies virtually won control of entire New Guinea coast line after U.S. troops staged 200-mi. amphibious leap, seizing Sansapor coastal area of Netherlands New Guinea and near-by islands of Amsterdam and Middelburg.

31. Large U.S. tank units pummeled German forces in Domfront area after capturing Avranches in drive toward Brittany. ¶ Tinian Island in Marianas was conquered by U.S. marines after nine-day battle.

AUGUST, 1944

- 1. U.S. 1st army broke through nazi lines in Normandy peninsula and hammered spearheads into Brittany. ¶ Baron Mannerheim was appointed president of Finland, succeeding Pres. Risto Ryti. ¶ Russian capture of Kaunas, prewar capital of Lithuania, was announced by soviet high command. ¶ Sergio Osmeña was sworn in as president of Philippine commonwealth following death of Manuel Quezon.
- 2. Turkey broke off economic and diplomatic relations with reich. ¶ Prime Minister Churchill predicted in commons speech that interval between defeat of Germany and defeat of Japan might be shorter than expected. ¶ German broadcast admitted that Rommel had been wounded seriously on Normandy front.
- 3. Russian troops broke through German line on Vistula river. ¶ Myitkyina was captured by Lt. Gen. Stilwell's troops in north Burma, Allied announcement said.
- 4. U.S. 1st army tank columns fanned out through Brittany and reached junction centre of Rennes. ¶ U.S. carrier task force caught Japanese convoy in Bonin and Volcano islands area, and destroyed or damaged 46 Japanese convoy

Paris, shortly after its liberation in Aug. 1944. Gen. Charles de Gaulle (centre background) is shown about to lead a parade of celebrants at the Arc de Triomphe

nese ships. ¶ Allied armies entered city of Florence. ¶ Army of 25,000 Polish underground troops battled with strong German forces in Warsaw.

- 6. Drive of U.S. 1st army tanks in France resulted in capture of Mayenne, Laval, Château Gontier and Vannes. ¶ Drogobych, Polish oil centre in Galicia, was captured by Russian troops.
- 7. Six-day transit strike in Philadelphia ended after army ordered strikers to return to work.
- 8. Eight German army officers, including Marshal von Witzleben, were hanged in Berlin two hours after their conviction on treason charges by special "peoples' tribunal."
- 9. U.S. motorized forces advanced on Brittany peninsula and reached cities of Nantes, Angers and Le Mans. § Sinking of more than 500 nazi submarines after beginning of World War II was claimed in joint statement by Roosevelt and Churchill.
- 10. Gen. Eisenhower disclosed that Allied air-borne forces were merged into single command under Lt. Gen. Lewis H. Brereton.
- 13. Elements of German 5th and 7th armies withdrew toward Seine river to escape entrapment by U.S. and British forces in Falaise-Argentan gap.
- 14. Announcement that and French armoured division led by Brig. Gen. Jacques-Philippe Leclerc had gone into action on French soil was made by Allied headquarters.
- 15. U.S. and French troops invaded southern French coast and established beachheads on broad front between Marseilles and Nice.

- 16. Argentina's gold stocks in U.S. were frozen by government order.
- 17. Gen. Patton's 3rd army captured Chartres, Orléans and Dreux. ¶ German garrison at St. Malo surrendered to Allied forces. ¶ Russian troops under Gen. Ivan Chernyakhovsky reached East Prussian frontier along Sesupe river.
- 18. Viscount Wavell, India's viceroy, rejected Mohandas K. Gandhi's request for interview, it was disclosed; Gandhi offered full support of war effort in exchange for immediate independence.
- 20. Populace of Paris broke out in armed revolt against German occupation authorities.
- 21. German garrisons in Paris were outflanked by Gen. Patton's armoured columns which crossed Seine river south of French capital. ¶ French troops smashed their way into naval base of Toulon in bitter fighting.
- 23. Deauville, Houlgate and Cabourg fell to British and Canadian forces. ¶ King Michael of Rumania ordered his armed forces to cease firing and accepted Allied terms of unconditional surrender. ¶ French infantry and armoured units entered Marseilles.
- 24. Charles E. Wilson resigned as executive vice-chairman of WPB, declaring that press attacks instigated by Chairman Nelson's aides impaired his value to war program; Julius A. Krug was appointed acting WPB chairman.
- 25. U.S. troops of Gen. Patch's 7th army occupied Cannes and Grasse, Allied communiqué disclosed. ¶ New Rumanian government declared war on reich. ¶ Paris was liberated when Gen. Dietrich von Choltitz, commander of German garrison in Paris, surrendered to Gen. Leclerc.
- 26. British infantry established bridgeheads across Seine river at Vernon and Louviers. ¶ Moscow radio disclosed that Bulgaria promised to quit war, become neutral and disarm German forces in its territory; Bulgar radio announcement said Sofia had approached Washington and London for peace terms.
- 28. U.S. tanks entered Château Thierry, scene of U.S. victory in 1918. ¶ U.S. commander officially delivered city of Paris to Lt. Gen. Joseph-Pierre Koenig, who assumed duties as military commander of capital.
- 29. U.S. troops staged victory parade in French capital as thousands of cheering Parisians lined Champs-Elysées. ¶ Rumanian port of Constanta was captured by Russian armies driving down Black sea coast. ¶ "General agreement" on structure and aims of international organization to preserve peace was announced by chairmen of U.S., British and soviet delegations at Dumbarton Oaks Security conference.
- 30. Rumanian oil city of Ploesti was taken by soviet troops.
- 31. Russian armies under Marshal Rodion Y. Malinovsky entered Bucharest. ¶ Allied armies in France speeded drive toward Belgian and German frontiers; British and army captured Amiens and crossed Somme river; U.S. 1st army bridged Meuse river and drove toward Sedan; U.S. 3rd army plunged into Argonne forest in drive toward Verdun and Metz. ¶ Maj. Gen. Jean de Lattre de Tassigny's French troops driving into southwestern France rolled through cities of Montpellier, Béziers and Narbonne; one section of Gen. Patch's U.S. troops driving up Rhone valley captured Valence, while another advancing eastward along Riviera took Nice.

SEPTEMBER, 1944

1. British and Canadian troops overran Dieppe and Arras, while St. Mihiel and Verdun fell to U.S. 3rd army.

- ¶ Bulgarian armistice talks with Allies were suspended suddenly after Premier Ivan Bagrianoff announced resignation of his cabinet. ¶ Troops of German 19th army fled Lyon as French and U.S. forces advanced up both banks of Rhone river. ¶ Russian forces captured Rumanian port of Giurgiu on Danube river and reached Bulgarian frontier.
- 2. U.S. 1st army troops raced across Belgian frontier, capturing Tournai. ¶ Pisa fell to U.S. 5th army troops who crossed Arno river on broad front. ¶ Finnish Premier Antti V. Hackzell announced that Finland had decided to negotiate armistice with Russia and that German troops had been asked to leave country by Sept. 15.
- 3. Prince Bernhard was named commander of Netherlands underground forces.
- 4. British troops climaxed four-day 225-mi. drive with capture of Brussels in Belgium, and Antwerp and Breda in Netherlands. ¶ Firing ceased on Finnish front as Russo-Finnish armistice went into effect.
- 5. Angered by Sofia cabinet's delay in signing armistice, soviet union declared war on Bulgaria.
- 6. U.S. 3rd army detachments in France crossed Moselle river. ¶ Hungary announced its armies had opened hostilities against Rumania in defense of Transylvania area.
- 7. Fall of Ghent and Armentières to British forces was announced in Allied communiqué; U.S. 1st army troops captured Sedan. ¶ U.S. air base at Lingling was captured by Japanese troops.
- 8. Canadian 1st army occupied Ostend while U.S. 1st army troops captured Liége. ¶ Premier Hubert Pierlot's government left its seat of exile in London and returned to Brussels. ¶ Black sea port of Varna was seized by Russian troops driving into Bulgaria. ¶ Bulgaria announced declaration of war against reich.
- 9. Bulgaria ended four-day war with Russia, agreed to an armistice and Kimon Georgieff became premier of new Sofia cabinet.
- 10. Lt. Gen. Hodges' 1st army troops crossed into Luxembourg.
- 11. Germany was invaded for first time since French patrol incursion in 1939 as Gen. Hodges' 1st army pushed five miles into German soil north of Trier. ¶ Gen. Patch's U.S. 7th army made contact with Gen. Patton's 3rd U.S. army, 16 mi. W. of Dijon.
- 12. German garrison in Le Havre surrendered to British forces. ¶ Rumania signed armistice with United Nations, and Russian Marshal Rodion Y. Malinovsky signed document in behalf of soviet union, U.S. and Great Britain.
- 13. Moscow announced that Russian armies had reached Czechoslovak border in drive from southern Poland; soviet armies northeast of Warsaw captured Lomza. ¶ Moscow revealed that Rumania, under armistice terms, agreed to join Allies, pay \$300,000,000 in reparations to Russia and return Bessarabia and northern Bukovina to soviet union; in return, Rumania was to get back Transylvania from Hungary and maintain own civil administration in noncombat zones.
- 14. Warsaw suburb of Praga was occupied by Russian troops. ¶ U.S. marines invaded Peleliu Island in Palau group.
- 15. U.S. troops invaded Morotai Island in northernmost Moluccas group in amphibious leap that put Gen. MacArthur's troops within 300 mi. of Philippines.
- 16. Roosevelt and Churchill concluded second Quebec parley and pledged that Allies would shift entire armed might to Pacific to speed defeat of Japan as soon as

Germany was beaten ¶ Russian forces entered and drove beyond Sofia in push toward Yugoslav border. ¶ German high command announced it could not evacuate all its troops from Finland by Sept. 15 deadline demanded by that country and would continue "to protect its security."

17. Large Allied air-borne army landed in Netherlands in attempt to flank Germans on Rhine's north bank.
¶ German army of 20,000 men, commanded by Maj. Gen. Erich Elster, surrendered to U.S. forces in Beaugency, France. ¶ Gen. Chennault's command disclosed that U.S. 14th air force destroyed and abandoned its air bases near Kweilin.

18. Mob of 7,000 Romans seized Donato Caretta, fascist prison official, while he was waiting trial in palace of justice, beat him into unconsciousness and then hurled him into Tiber river to drown. ¶ Allied broadcast said AMG operating under Gen. Eisenhower would administer authority in Allied-occupied regions of reich.

19. Finland signed armistice with Russia and agreed to pay \$300,000,000 indemnity, accept 1940 borders, cede Petsamo and Porkkala peninsula to Russia and disarm all German troops in Finland.

20. Nijmegen bridge in Holland was captured intact by U.S. air-borne troops.

21. Brussels broadcast said Prince Charles of Belgium was sworn in as regent of Belgium to serve in absence of King Leopold. ¶ Tiny republic of San Marino declared war against Germany. ¶ Jefferson Caffery was named by Pres. Roosevelt as U.S. ambassador to de facto De Gaulle government established in Paris.

22. Red army columns captured Estonian capital of Tallinn and opened Gulf of Finland to soviet Baltic fleet. § Fall of Rimini to Gen. Oliver W. H. Leese's British 8th army in Italy was announced in Allied communiqué. § Firing squad of 14 Italian policemen executed Pietro Caruso, Roman police chief.

23. Hitler's Baltic armies were split in two by Russian wedge driven into Estonia at Rıga gulf.

24. U.S. 5th army troops swept through Gothic line in Italy and reached positions 15 mi. from Bologna. ¶ Batavia area of Java was raided for first time by Allied bombers that made 3,000-mi. round-trip from bases in Australia. ¶ British forces landed on Greek mainland.

25. Revised British social security plan under which every Briton would be insured against want was published in White Paper.

26. State department announced that U.S. ships would be forbidden to pick up cargoes in Argentine ports after Oct. 1.

27. Some 2,000 survivors of original 8,000 men of British 1st air-borne (Red Devil) division escaped German trap at Arnhem and withdrew to safety of Allied lines. ¶ Invasion of Albania by Allied forces was announced in Allied communiqué.

28. Churchill warned against over-optimism in Allied camp and said it was possible that war in Europe would continue into 1945.

29. Conferees at Dumbarton Oaks announced officially that "large measure of agreement" had been reached ¶ Argentina was accused of repudiating "solemn inter-American obligations" by Pres. Roosevelt. ¶ Polish government-in-exile dropped Gen. Kazimierz Sosnkowski as commander in chief of Polish armed forces and named Lt. Gen. Tadeusz Komorowski (Bor) as his successor.

30. U.S. 7th army broke through Vosges foothills and drove to within seven mi. of French border city of Belfort.

¶ Lt. Gen. Komorowski (Bor) was accused of starting premature uprising in Warsaw against German occupation troops, by Edward B. Osubka-Morawski, chairman of Russian-sponsored Polish Committee of National Liberation. ¶ German broadcast said Marshal Pétain had fled to Germany from Belfort, leaving reins of defunct Vichy government in hands of Fernand de Brinon. ¶ Russian armies entered Yugoslavia and launched drive on Belgrade. ¶ Chairman Donald M. Nelson resigned from WPB to accept undisclosed "major task" offered by Pres. Roosevelt and was succeeded by Acting Chairman Julius A. Krug.

OCTOBER, 1944

1. Canadian troops occupied Calais after surrender of German garrison. ¶ U.S. forces completed 18-day campaign in Palaus, cleaning up all Japanese resistance—save for two isolated pockets—on islands of Peleliu, Ngesebus, Kongauru and Angaur, Adm. Nimitz disclosed.

2. Lt. Gen. Komorowski (Bor) and his patriot army in Warsaw surrendered to Germans after 63 days of bitter battle. ¶ Neutral governments were asked by U.S. state department to prevent axis nationals from shipping their loot to neutral territories.

3. U.S. 1st army drove through section of Siegfried line at Ubach, front dispatches asserted.

6. Marshal Malinovsky's 2nd Ukrainian army invaded Hungary on 73-mi. front, Moscow communiqué said. ¶ Prime Minister Pieter S. Gerbrandy said that Netherlands faced postwar famine and ruin if Germans continued systematic wrecking of dykes, pumping stations and industrial plants.

8. Russian force of 500,000 troops advanced 62 mi. in drive to trap German armies in Lithuania, Premier Stalin disclosed. ¶ Creation of two new ministries was announced by Churchill government; Viscount Swinton was named head of new ministry of civil aviation, while Sir William Jowett became minister of social insurance.

9. Big Four-U.S., Britain, Russia and China-announced that Dumbarton Oaks conferees would recommend creation of international security organization known as "The United Nations," which would be empowered to use armed force to maintain world peace. § St. Louis National league baseball team (Cardinals) defeated St. Louis American league team (Browns) in world series, winning four games to two.

12. Dispatches from Bordeaux disclosed that that city was firmly in French hands. ¶ U.S. carrier planes from Vice-Adm. Mitscher's task force and Adm. Halsey's 3rd fleet destroyed 396 planes and sank or damaged 100 ships and small craft in 48-hr. attack against Japanese defenses on Formosa (Taiwan).

13. Russian armies captured Latvian capital of Riga. 14. Athens and near-by port of Piraeus (Peiraievs) were liberated by British and Greek troops.

15. Regent Nicholas Horthy's efforts to ask Allies for peace were frustrated by Hungarian fascist clique which overthrew his government and established pro-German regime headed by Ferenc Szalasy. ¶ Allied censors permitted disclosure that two giant artificial ports had been towed from Britain to France in sections and set up off Allied beachheads in Normandy shortly after D-day.

16. German-occupied Petsamo fell to Russian forces launching offensive in Finland's arctic regions, Moscow announced.

18. Prime Minister Churchill and Premier Stalin concluded ten-day parley in Moscow, and joint statement said two leaders agreed to pursue joint policy in Yugo-

slavia, were in accord on main points of Bulgarian armistice terms and made progress toward solving Polish problems. ¶ Red army smashed through Carpathian mountains on 171-mi. front and advanced 31 mi. into Czechoslovakia, Moscow announced. ¶ Hitler announced creation of volkssturm (home army) to defend reich; German males between 16 and 60, not in military service, were mobilized for new force.

20. U.S. forces under Gen. MacArthur invaded Leyte Island in Philippines. ¶ Red army and Yugoslav troops captured Yugoslav capital of Belgrade.

21. U.S. troops captured Tacloban, capital of Leyte Island, U.S. communiqué said. ¶ All Aachen came under U.S. control as survivors of nazi garrison surrendered to 1st army forces.

23. Premier Stalin disclosed that Red army forces under Gen. Ivan D. Cherniakhovsky had driven 19 mi. into East Prussia on 87-mi. front. ¶ Gen. de Gaulle's provisional government was recognized as de facto as well as de jure authority for France by U.S., Britain, U S.S.R. and Canada.

25. Russian arctic forces invaded Norway and captured Kirkenes, on Barents sea, Premier Stalin announced. ¶ U.S. and Britain accorded diplomatic recognition to Italy.

Workers for the C.I.O. Political Action committee preparing campaign posters in 1944. P.A.C. activities were credited with contributing in large measure to the re-election of Pres. Roosevelt, by encouraging a large turnout of voters from among union ranks



26. Disclosure that Col. Gen. Heinz Guderian, German chief of staff, had assumed command of all wehrmacht forces on eastern front was made in nazi broadcast.

27. Japanese fleet was decisively defeated and routed in battle for Leyte gulf by 3rd and 7th U.S. fleets; 24 Japanese warships, including 2 battleships and 4 carriers, were sunk and about 36 other warships were badly damaged in battle, Oct. 22 to 27. ¶ British 2nd army driving toward mouth of Maas (Meuse) river captured Tilburg and 's Hertogenbosch. ¶ Ruthenian capital of Ungvár (Uzhorod) in eastern Czechoslovakia was captured by Gen. Ivan Petrov's 4th Ukrainian army.

28. Gen. MacArthur announced his troops had won Samar Island and had "completely defeated" 16th Japanese division on Leyte Island. ¶ Gen. Stilwell was recalled from his post in China, White House announced; it was also revealed that China-Burma-India war theatre had been divided into two commands, under Maj. Gen. Albert C. Wedemeyer and Lt. Gen. Daniel I. Sultan. ¶ Bulgaria signed armistice with United Nations.

29. Russia refused to participate in international civil aviation conference because Switzerland, Portugal and Spain, described as "hostile" nations, had been invited. ¶ Polish troops under Canadian command captured strategic Netherlands town of Breda.

31. Prime Minister Churchill told parliament that war against Germany probably would not be over before Easter 1945.

NOVEMBER, 1944

1. British commandos invaded Netherlands island of Walcheren in drive to knock out German batteries commanding entrance to Schelde estuary. ¶ Pres. Roosevelt's message to opening session of International Civil Aviation conference at Chicago urged avoidance of "great blocs of closed air" in planning world air agreements.

2. Pres. Roosevelt named Donald M. Nelson as his "personal representative" with rank corresponding to that of cabinet member, and asked Nelson to return to China to speed output of war industries there. ¶ Gen. Andrew G. L. McNaughton was named Canadian minister of national defense, succeeding Col. J. L. Ralston.

3. Generalissimo Francisco Franco, in interview with U.S. reporter, denied that Spain had ever been fascist or secretly allied with axis powers.

4. Allied communiqué announced that British troops and Greek patriots had driven all German forces from Greece.

5. Budapest was shelled by Russian big guns as advancing soviet troops captured Andrassy, 4½ mi. from Hungarian capital.

6. Japan was branded a typical aggressor by Premier Stalin, who urged creation of special postwar armed force to suppress aggression.

7. Pres. Roosevelt was re-elected for fourth term, defeating Gov. Dewey by 432 electoral votes to 99. ¶ Gen. de Gaulle granted pardon to Maurice Thorez, French communist leader, and permitted his return from Moscow.

8. Berlin radio announced that Germans had been bombarding London for several weeks with V-2, new long-range rocket weapon.

9. Forli was taken by British 8th army in Italy.

11. Prime Minister Churchill arrived in Paris for parleys with Gen. de Gaulle. ¶ RCA and CBS recording subsidiaries ended two-year fight with Pres. James C. Petrillo of American Federation of Musicians and signed contracts

under which A.F. of M. would get fee on each record manufactured. ¶ Finnish radio announced that Juho K. Paasikivi had accepted premiership of new Finnish government.

12. Giant 45,000-ton "Tirpitz," reich's last battleship, was sunk by R.A.F. § Gestapo Chief Himmler read proclamation assertedly written by Hitler, marking Munich putsch anniversary, which exhorted Germans to fight for reich's survival. § Leyte-bound convoy of six Japanese destroyers and four transports, carrying estimated 8,000 troops, was sunk by carrier planes from Adm. Halsey's 3rd fleet.

13. U.S. 14th air force in China disclosed that it had destroyed its base at Liuchow to prevent its capture by Japanese.

16. Six Allied armies on western front opened heavy offensive to crack German defenses west of Rhine.

17. Vice-President Juan Perón announced that new Argentine army law would require training for all men and women from age of 12.

19. Director Fred Vinson of Economic Stabilization said administration was not contemplating upward revision of "little steel" formula, but stressed that rising living costs "must stop."

20. Gen. Jean de Lattre de Tassigny's French 1st army captured Belfort; Gen. Patton's 3rd army captured Metz. ¶ Generalissimo Chiang Kai-shek responded to popular clamour for overhauling his regime by dropping Gen. Ho Ying-chin as war minister, replacing him with Gen. Chen Cheng.

22. C.I.O. convention agreed unanimously to make C.I.O. Political Action committee a permanent political instrument.

23. Canadian government risked political crisis by departing from policy of voluntary enlistment for overseas service and ordered that 16,000 drafted men be made immediately available for duty overseas.

24. Tokyo was bombed for first time by B-29 superfortresses, from Saipan Island bases. ¶ Chairman Julius A. Krug of WPB ordered substantial production increases of small arms ammunition and mortar shells as result of urgent appeal from Gen. Eisenhower for more munitions. ¶ Failure of his colleagues to yield on border dispute with Russia caused Stanislaw Mikolajczyk to resign as premier of Polish government-in-exile.

26. Luzon Island was attacked for fifth time in three weeks by Pacific aircraft carriers whose planes sank 18 ships and small craft and destroyed 64 planes, navy communiqué said. ¶ Increasing leftist dissatisfaction in Italy resulted in resignation of Premier Ivanoe Bonomi and his cabinet. ¶ Gen. Sir Henry Maitland Wilson was named head of British joint staff mission in Washington; Gen. Sir Harold R. L. G. Alexander, who was designated a field marshal, succeeded Sir Henry as supreme Allied commander in Mediterranean while Lt. Gen. Mark W. Clark became commander of Allied 15th army group in Italy.

27. Cordell Hull resigned as secretary of state because of ill health; Pres. Roosevelt named Edward R. Stettinius, Jr., as Hull's successor, and appointed Maj. Gen. Patrick J. Hurley as ambassador to China.

28. Premier Hubert Pierlot banned parades and demonstrations in Belgium after workers called strikes to protest government order to disarm resistance groups.

29. U.S. pilots sank 13 Japanese troop transports and warships in convoy bound for Leyte; estimated 4,000

Japanese troops were believed to have drowned.

30. Pres. Roosevelt stepped into feud between Att'y Gen. Biddle and Norman M. Littell, assistant attorney general, and dismissed latter on grounds of insubordination. Tomasz Arciszewski formed new cabinet for Polish government-in-exile.

DECEMBER, 1944

1. Gen. Patton's 3rd army penetrated Saar valley and drove within eight mi. of Saarbrücken. ¶ U.S. government order halted civilian reconversion projects in more than 126 cities for 90-day period, in effort to speed up lagging war production. ¶ Foreign Sec'y Eden charged that Count Sforza had worked against Premier Bonomi's government from its inception but denied that Britain had vetoed his inclusion in Italian cabinet.

2. Allied army completely freed Strasbourg of German troops.

3. Saar river was crossed by infantry units of U.S. 3rd army. ¶ Ten persons were killed and many more wounded when Greek E.A.M. resistance organization defied government orders and staged demonstration in Athens square. ¶ Russian forces captured Miskolcz, German stronghold northeast of Budapest capital.

4. Chiang Kai-shek appointed T. V. Soong acting president of Executive Yuan. ¶ Bloody rioting broke out in Athens and general strike paralyzed city cutting off all electricity, gas and communication facilities.

5. British tanks fired on troops of E.L.A.S. (fighting arm of E.A.M.) as civil war flared in Greece between leftist-liberal factions and British-supported rightists. ¶ Churchill assured commons that Greeks would be allowed to express their wishes in free voting but warned he would use British army to maintain "law and order" in Greece until that time

7. Seismograph recordings in United Nations observatories indicated that Japan was rocked by violent earthquakes.

8. Churchill's policy of intervention in Greece won 281-32 vote of confidence in commons. ¶ Chinese forces in Kweichow province recaptured Tuhshan in surprise counterattack.

9. U.S. selective service authorities announced induction into armed forces of men in age group 26 through 37 would be resumed in order to meet increasing needs of armed forces and war manpower shortage.

10. Japanese base of Ormoc on western coast of Leyte Island was captured by U.S. 77th division. ¶ De Gaulle-Stalin parleys in Moscow were climaxed by signature of Franco-soviet pact of alliance and mutual assistance.

11. Record fleet of 1,600 U.S. heavy bombers from British bases bombed German rail yards at Frankfurt-on-Main and other cities. ¶ REA Administrator Harry Slattery resigned, charging that Sec'y Wickard "illegally" displaced him as actual administrator.

12. St. Lawrence seaway proposal was defeated in senate by roll-call vote of 56 to 25. ¶ Premier Ivanoe Bonomi reformed cabinet and assured Allies that his regime would respect armistice terms.

13. Norman Armour was appointed ambassador to Spain; Laurence A. Steinhardt was named ambassador to the Czechoslovak government-in-exile. ¶ British Labourites were told by Ernest Bevin, labour minister, that British action in Greece had been taken with knowledge and approval of Russia and U.S.

15. Gen. MacArthur landed troops without losses on Mindoro Island. ¶ Chinese troops in Burma captured Bhamo in surprise drive, annihilating Japanese garrison.

- ¶ Senate unanimously approved promotions of Generals Marshall, MacArthur, Eisenhower and Arnold to new rank of Generals of the Armies; and of Admirals Leahy, King and Nimitz to Admirals of the Fleet. ¶ Prime Minister Churchill told commons that he would support soviet union's territorial claims in Russo-Polish border dispute.
- 16. Pres. Roosevelt "reluctantly" signed bill to freeze social security tax at 1% for 1945, declaring that this low rate would handicap benefits.
- 17. Allied armies on western front were severely jolted by powerful offensive launched by Field Marshal von Rundstedt against U.S. 1st army's sector.
- 19. Senate confirmed appointment of following aides to Sec'y Stettinius: Joseph C. Grew as undersecretary, and William L. Clayton, Nelson A. Rockefeller, Archibald MacLeish, James C. Dunn and Brig. Gen. Julius C. Holmes as assistant secretaries. ¶ Pres. Roosevelt declared that Atlantic Charter was not formal document.
- 20. Foreign Sec'y Eden insisted in statement to commons that Churchill government would neither oppose regency nor try to force unpopular king on Greek people.
- 21. Claims that Marshal von Rundstedt's armies tore 60-mi. hole in centre of Allied positions on western front were made by German commentators.
- 22. Announcement that Britain would call up 250,000 more fighting men for 1945 was made by Prime Minister Churchill's office.
- 23. All horse racing was banned indefinitely as of Jan. 3, by Director Byrnes of War Mobilization and Reconversion, in move to save labour and critical materials. ¶ Return of good flying weather enabled Allies to send more than 5,000 planes over western front to support U.S. forces striving to halt nazi offensive. ¶ Sen. Hatch (N.M.) and Sen. Ball (Minn.) in joint statement expressed concern over trend of Allied policy to settle important decisions unilaterally.
- 24. Christmas message of Pope Pius endorsed international organization to preserve peace and hinted approval of punishment of war criminals, but warned against indicting entire people for crimes of few. ¶ New and severe rationing of major food items to go into effect Dec. 31 was announced by OPA.
- 25. Prime Minister Churchill and Foreign Sec'y Eden arrived in Athens by plane in effort to bring halt to civil war in Greece.
- 26. Gen. MacArthur said organized Japanese resistance on Leyte Island had ended.
- 27. U.S. garrison besieged in Bastogne was relieved by U.S. armoured force. ¶ Agreement on establishment of regency was reached in Athens conference of Greek left and right wing political leaders.
- 28. U.S. army seized Montgomery Ward plants in Chicago and six other cities after firm refused to obey WLB directives. ¶ German broadcasters admitted that Marshal von Rundstedt's offensive was halted by fierce Anglo-American resistance on western front.
- 29. Disclosure that U.S. navy was world's largest, with 61,045 vessels, including 1,167 warships and 54,206 landing craft was made in navy department's production report. ¶ Gen. de Gaulle's cabinet decided to call up 200,000 men for military service at end of Jan. 1945. ¶ Allied communiqué said Chinese troops under command of Lt. Gen. Daniel I. Sultan of U.S. army in Burma had crossed into Burma-China frontier, capturing Loiwing.
- 30. Archbishop Damaskinos was appointed regent of Greece by King George II. ¶ Russian forces broke into streets of Pest, Hungary, after nazis had killed two soviet emissaries carrying surrender terms under truce flags.

31. Polish provisional government was formed in Lublin with Boleslaw Berut as president and Edward B. Osubka-Morawski as premier and minister of foreign affairs. ¶ Archbishop Damaskinos was sworn in as regent of Greece after resignation of Premier George Papandreou and his cabinet. ¶ Chinese people were promised constitutional government before war's end in Generalissimo Chiang Kaishek's New Year's message.

JANUARY, 1945

- 1. Adolf Hitler said German people would never capitulate because surrender would mean "enslavement." ¶ Sec'y of State Stettinius announced U.S. would continue to recognize Polish regime in London despite formation of Russian-sponsored Lublin committee. ¶ France formally joined United Nations.
- 2. Gen. Nicholas Plastiras was designated to form government as Greek civil war continued to rage.
- 3. Battle of Ardennes reached turning point as U.S. 1st army attacked German lines on northern perimeter of Belgian bulge. ¶ Philippine Island of Marinduque was occupied by Lt. Gen. Walter Krueger's U.S. 6th army. ¶ Strategic Burmese port of Akyab was occupied by British imperial amphibious forces.
- 5. Soviet union recognized provisional Lublin government, bringing to head Big Three quarrel over fate of postwar Poland.
- 9. U.S. troops under Gen. MacArthur's command landed on Luzon Island at Lingayen gulf, about 107 mi. from Manila. ¶ Pres. Roosevelt asked congressional approval of \$83,000,000,000 budget for 1946 fiscal year, of which \$70,000,000,000 would be earmarked for war effort.
- 11. Cancellation of U.S. train service providing seasonal transportation to resort towns, and of all trains whose seats were 65% vacant during Nov. 1944 was ordered by Col. John Monroe Johnson, ODT chief. ¶ Japanese bases in French Indo-China, including Saigon, were subjected to blistering attack by carrier planes of U.S. 3rd fleet which sank 41 Japanese ships and damaged 28 others; 112 Japanese planes were destroyed.
- 12. Marshal von Rundstedt's armies began retreat from Ardennes bulge. ¶ Russians opened giant drive in south central Poland, advancing 25 mi.
- 13. China coast was attacked for first time by U.S. carrier planes which bombed Japanese targets at Hong Kong, Amoy and Swatow.
- 15. Nation-wide dimout of lighting in outdoor show windows, signboards and theatre marquees to start Feb. 1 was ordered by WPB. ¶ Gen. Sultan, commander of U.S. forces in Burma and India, announced that Ledo road linking India and China had been completed.
 - 17. Warsaw was liberated by Red army troops.
- 18. E.A.M. (National Liberation Front) party of Greece was assailed as "Trotskyites" by Prime Minister Churchill.
- 19. German lines in Poland collapsed under sledgehammer Russian onslaughts as soviet forces captured Lodz, Cracow and Tarnow and reached border of German Silesia. ¶ German Ardennes counteroffensive was termed failure by Allied supreme headquarters which added that Von Rundstedt's drive had not "seriously affected" Allied plans.
- 20. Franklin D. Roosevelt was inaugurated for fourth term as president of U.S. ¶ Disclosure that 6,300 of 15,600 Canadian soldiers scheduled for overseas duty were absent without leave was made by Canadian national defense headquarters. ¶ Provisional Hungarian regime seated at

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- Debrecen signed armistice agreement with U.S., Russia and Britain; Marshal Klementiy Voroshilov signed truce document for Big Three. ¶ U.S. forces sweeping southward through Luzon captured Tarlac and were only 65 mi. from Manila
- 21. Hungary surrendered unconditionally to Allies, declared war on Germany and agreed to pay equivalent of \$300,000,000 in reparations in kind, U.S. state department disclosed. § Soviet armoured columns drove 19 mi. into German Silesia, and to the north captured Junker shrine of Tannenberg in East Prussia. ¶ Jesse Jones acceded to Pres. Roosevelt's request and resigned as secretary of commerce and as head of government financing agencies.
- 22. King Peter of Yugoslavia dismissed Dr. Ivan Subasitch as premier because of latter's willingness to co-operate with Marshal Tito's regime.
- 23. Marshal Ivan S. Konev's 1st Ukrainian army reached Oder river on 37-mi. front.
- 25. Sec'y Stimson confirmed that Gen. Stilwell had been named commander of U.S. army ground forces. ¶ U.S. troops overran Clark field and Fort Stotsenburg in drive toward Manila.
- 26. Herbert C. Pell resigned as U.S. member of United Nations War Crimes commission after congress failed to appropriate funds for his post.
- 27. Stoppage in making or delivering machinery for production of peacetime goods was ordered by WPB.
- 28. Baltic port of Memel and Silesian industrial centres of Beuthen and Katowice fell to Russian armies. ¶ Generalissimo Chiang Kai-shek named new Burma-Ledo road after Gen. Stilwell.
- 29. Marshal Zhukov's 1st White Russian army invaded Pomerania. ¶ King Peter of Yugoslavia backed down on regency dispute and reappointed Dr. Subasitch as premier.
- 30. Adolf Hitler told his countrymen that he expected them to die in their tracks in defense of Germany. ¶ Naval base of Olongapo on Subic bay fell to U.S. forces in Luzon. ¶ \$13 captives were rescued from Japanese prison camp in eastern Luzon by U.S. "Rangers" and Philippine guerrillas.

FEBRUARY, 1945

- 1. Sinking of huge Singapore floating dock by U.S. Superfortresses was indicated in reconnaissance photographs.
- 2. U.S. and French troops battled way into Alsatian city of Colmar after hard street fighting. ¶ Alexei was unanimously elected patriarch of Russian Orthodox Church by council of bishops in Moscow.
- 3. Troops of U.S. 1st cavalry division entered Manila and captured Santo Tomas prison camp, freeing several thousand internees.
- 5. Gen. de Gaulle demanded separation of Rhineland and Ruhr from reich and occupation of entire Rhine area by French troops; he also declared France would not be bound by decisions reached by Big Three in absence of France. ¶ Electoral defeat of Defense Minister McNaughton of Canada was viewed as sign of popular disapproval of Prime Minister Mackenzie King's failure to apply full conscription for overseas duty.
- 6. Fall of Manila was formally proclaimed by Gen. MacArthur although isolated Japanese units in city continued resistance.
- 7. Marshal Zhukov's armies reached Oder river near Kuestrin and were 38 mi. from Berlin. ¶ Hubert Pierlot resigned as premier of Belgium.
 - 8. Premier Pieter Gerbrandy's cabinet resigned and he

- was renamed to form Netherlands government to include representatives of liberated areas.
- 10. Proposal calling for 29 amendments to Dumbarton Oaks plan for world security was submitted to U.S. and Britain by Polish government in London. ¶ Baltic port of Elbing fell to Russian armies in East Prussia.
- 11. Pres. Roosevelt, Premier Stalin and Prime Minister Churchill met at Yalta, Feb. 4–11, and agreed (1) to crush naziism and German militarism; (2) to establish popular governments in liberated countries; (3) to make Germany pay reparations in kind for war damages; (4) to set up occupation zones in conquered Germany; (5) to call a United Nations conference at San Francisco, Calif., April 25; and (6) to broaden base of Polish and Yugoslav governments. ¶ Achille van Acker, Socialist, formed coalition Belgian government, including representatives of Communist and Conservative parties.
- 12. British-supported Greek government and E.A.M. leftist parties reached accord to end civil war.
- 13. Russian forces won all Budapest after bitter 50-day siege. ¶ Polish regime in London said it could not be bound by Yalta decisions for revising Poland's frontiers.
- 14. Capture of Cavite naval base on Luzon by 11th airborne division was announced in U.S. army communiqué. ¶ Two German agents, William C. Colepaugh and Erich Gimpel, were sentenced to death by hanging after secret trial by U.S. military commission.
- 16. Torpedoing and sinking of Japanese prison ship carrying 1,800 Americans was reported to war department by five survivors of disaster. ¶ U.S. air-borne and ground forces invaded Corregidor.
- 17. Armada of 1,200 U.S. carrier planes in first raid in force on Tokyo rained bombs on that city and surrounding area for two days in succession. ¶ World Trades Union conference sitting in London set up committee of 41 members to draft plans for formation of new international labour body. ¶ All German assets in Switzerland were ordered frozen by Swiss federal council in move to prevent nazis from shipping loot to that country.
- 19. U.S. 4th and 5th marine divisions invaded Iwo Jima in Volcano group.
- 20. White House disclosed that Prime Minister Churchill told Pres. Roosevelt in talks at Alexandria, following Yalta conference, that Britain was determined to give fullest possible assistance in battle against Japan after defeat of Germany; Roosevelt later received King Farouk of Egypt, Emperor Haile Selassie of Ethiopia and King Ibn-Sa'ud of Saudi Arabia aboard U.S. war vessel anchored in Great Bitter lake.
- 21. Pres. Avila Camacho of Mexico "deplored" absence of Argentina at Inter-American Conference on Problems of War and Peace which opened in Mexico City. ¶ U.S. 3rd marine division was thrown into battle for Iwo Jima as Japanese attacks against original landing forces grew in fury. ¶ U.S. escort carrier, "Bismarck Sea," was sunk by Japanese planes off Iwo Jima.
- 23. Great Allied offensive into Germany opened on western front as U.S. army forces hurdled Roer river barrier. ¶ 48,000 Germans were killed or captured in Posen battle as soviet forces captured Polish city after month-long siege. ¶ Turkey declared war on axis in order to win seat at San Francisco parley of United Nations. ¶ U.S. and Filipino troops struck behind Japanese lines and freed 2,146 civilian war prisoners from Los Banos concentration camp.
- 24. Japanese troops in Intramuros quarter of Manila were annihilated, thus ending all resistance in Philippine capital. ¶ Adolf Hitler urged every man, woman and

child in reich to fight until last breath, and threatened death for all shirkers.

25. Dueren fell to Lt. Gen. Hodges' 1st army. ¶ Red army troops captured Preussich Friedland in big drive toward Baltic coast of Pomerania. ¶ Canadian mounted police and army troops frustrated efforts of mob of 1,500 men in Drummondville, Que., that attempted to free suspected army deserters and draft evaders from police custody. ¶ Mahmoud Nokrashy Pasha became premier of Egypt.

26. Midnight curfew on all places of amusement throughout United States went into effect. ¶ Syrian chamber of deputies voted declaration of war against Germany and Japan. ¶ Egypt's declaration of war against Germany and Japan was approved by both houses of parliament. ¶ Field Marshal Sir Harold Alexander and Marshal Tito reached agreement for co-ordinating their military activities, Allied communiqué said.

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27. Gen. MacArthur turned civil government of Philippines over to President Sergio Osmeña in formal ceremony.

28. Pres. Getulio Vargas of Brazil agreed to his cabinet's request to permit general elections for president, and said date for voting would be set in 90 days.

MARCH, 1945

- 1. Special joint session of congress heard Pres. Roosevelt, reporting on Yalta parleys, declare U.S. must collaborate in world peace organization or face possibility of third world war. ¶ Big Three's plans to establish world peace organization as outlined at Yalta parley were approved by 413 to 0 vote in Britain's house of commons. ¶ Henry Wallace was confirmed as secretary of commerce in senate by 56 to 32 vote.
- 2. U.S. 9th army forces of Lt. Gen. William H. Simpson reached Rhine's west bank at two places. ¶ Ryukyu Islands, 450 mi. below Japan proper, were bombarded for 48 hr. by U.S. surface craft and carrier planes.
- 3. Act of Chapultepec was unanimously adopted by 20 states represented at Inter-American conference in Mexico City; under act each signatory was pledged to protect territorial and political integrity of others.
- 4. Eastern Pomerania was sliced into three segments as Marshal Zhukov's 1st White Russian army reached Baltic coast at Kolberg and Marshal Rokossovsky's 2nd White Russian army reached sea at Köslin. ¶ German radio admitted that Dresden had been "wiped from map of Europe" by Allied bombs.
- 5. Fred M. Vinson, director of the Office of Economic Stabilization, was named to succeed Jesse H. Jones as federal loan administrator.
- 6. Cologne was occupied by Lt. Gen. Courtney H. Hodges' U.S. 1st army forces.
- 7. William H. Davis, chairman of WLB, was appointed director of economic stabilization. ¶ U.S. 1st army forces seized intact rail bridge at Remagen and poured across Rhine river.
- 10. 15 square miles of heart of Tokyo set afire by explosives dropped by 300 Superfortresses. ¶ Zamboanga peninsula of Mindanao Island in the Philippines was invaded by troops of Lt. Gen. Robert L. Eichelberger's U.S. 8th army. ¶ Rumania received official authority from Russia to take over administration of northern Transylvania in accordance with armistice terms.
- 11. Establishment of new interagency committee, designed to co-ordinate foreign shipments to "protect" U.S. domestic economy and support war effort, was announced by Director Byrnes of OWM; committee was placed under direction of Leo T. Crowley.

- 12. Oder river fortress of Kuestrin was captured by Marshal Zhukov's 1st White Russian army.
- 15. Duke of Windsor resigned as governor and commander in chief of Bahamas, colonial office in London announced.
- 16. Organized Japanese resistance on Iwo Jima ended; U.S. marine casualties were 4,275 dead, 19,540 wounded and 12 missing; Japanese dead were estimated at about 21,000.
- 17. Coblenz on Rhine's west bank fell to Gen. Patton's 3rd army forces.
- 18. U.S. infantry forces invaded Panay Island in central Philippines.
- 19. Returns of Finnish election disclosed that new Popular Democrat coalition, pro-Russian party, received 51 of 200 seats. ¶ U.S. carrier planes bombed Japanese warships in Inland sea, damaging between 15 and 17 Japanese naval units. ¶ U.S. 27,000-ton aircraft carrier "Franklin" suffered casualties of 832 in dead and missing and 270 wounded when it was struck by lone Japanese divebomber.
- 20. Mandalay was recaptured by British imperial forces in Burma. ¶ Soviet union informed Turkey of its desire to terminate Russo-Turkish pact of 1925.
- 22. U.S. 3rd army forces crossed Rhine in surprise offensive above Ludwigshafen. ¶ Dictator Franco was urged to relinquish power in Spain and pave way for restoration of monarchy by Don Juan, pretender to the Spanish throne. ¶ Disclosure that Field Marshal Kesselring had replaced Field Marshal von Rundstedt as commander in chief of German forces in west was made at headquarters of Allied 21st army group.
- 23. Pres. Roosevelt's nomination of Aubrey Williams as Rural Electrification administrator was rejected by senate, 52 votes to 36. ¶ Gen. de Gaulle announced that French Indo-China would gain limited autonomy after war. ¶ Germans fell back as British 2nd, U.S. 9th and Allied 1st airborne armies covered by huge air fleets, crossed Rhine in drive to seize Ruhr industrial area.
- 24. A 43-mi. advance was marked up by Marshal Tolbukhin's 3rd Ukrainian army driving westward through Hungary.
- 25. Marshal Malinovsky's 2nd Ukrainian army joined drive on Vienna with 28-mi. advance along Danube river's south bank, Moscow announced.
- 26. Landings on eastern coast of Cebu Island in Philippines were made by Gen. Eichelberger's U.S. 8th army.
 ¶ U.S. 14th air force in China evacuated its air base in Laohokow area.
 ¶ R.A.F. bombing of The Hague area on March 3, in which 800 Netherlands civilians were killed, was termed error and "deplorable catastrophe" by British government.
- 27. Argentine government declared war against Germany and Japan. ¶ Gen. Eisenhower declared that German main defensive line had been broken and that wehrmacht on western front was a "whipped army."
- 28. Baltic naval base of Gdynia was captured by Russian forces. ¶ Kerama isles in Ryukyu group were overrun by troops of U.S. 77th division.
- 29. Appointment of Maj. Gen. Lucius D. Clay as Gen. Eisenhower's deputy in charge of civil affairs in reich was announced by Pres. Roosevelt.
- 30. Russian armies on Baltic coast captured Danzig while other soviet columns in central Europe invaded Austria.
 - 31. Russia's request that Lublin provisional government

752 be invited to San Francisco conference was rejected by U.S. and Britain.

APRIL, 1945

1. U.S. 10th army invaded Okinawa in Ryukyu chain, 350 mi. from Japanese home islands; landings were covered by Adm. Spruance's U.S. 5th fleet and strong British carrier force under Vice-Adm. Sir Bernard Rawlings; U.S. ground forces were under command of Lt. Gen. Simon Bolivar Buckner, Jr. § Legaspi harbour on southern tail of Luzon was captured by U.S. forces in new amphibious landing. § Ruhr industrial basin was completely encircled when U.S. 9th army linked up with U.S. 1st army near Lippstadt.

2. U.S. troops invaded Tawitawi Island in Sulu archipelago about 30 mi. from Borneo. ¶ James F. Byrnes' resignation as director of Office of War Mobilization and Reconversion was announced; he was succeeded by Fred M. Vinson.

4. U.S. 3rd army broke into Thuringian plain and captured Gotha.

5. Soviet Russia denounced neutrality pact with Japan, accused Japanese of helping Germany and said agreement had lost its meaning. ¶ Gravity of Japan's military situation resulted in resignation of Premier Kuniaki Koiso's

New York subway riders' reaction to the news of Franklin D. Roosevelt's death on April 12, 1945

cabinet; Adm. Baron Kantaro Suzuki was called on to form new government. ¶ Appointment of Gen. MacArthur and Adm. Nimitz as commanders respectively of all army and navy forces in entire Pacific theatre was announced by joint chiefs of staff.

6. Six Japanese warships, including 45,000-ton battle-ship "Yamato," were sunk by U.S. carrier planes in action

50 mi. southwest of Kyushu.

7. Escorted by fighter planes for first time, about 100 superfortresses raided Nagoya and Tokyo suburbs; 173 Japanese planes were shot down by U.S. craft. ¶ Pres. Eduard Beneš named Zdeněk Fierlinger premier of new Czechoslovak cabinet, Moscow disclosed. ¶ Japanese 15th army in Burma, estimated at 50,000 men, "no longer exists as effective fighting force," Allied communiqué asserted. ¶ Huge German gold reserve as well as foreign currencies and art treasures were found by U.S. army forces in salt mine in Merkers.

9. U.S. and other American republics resumed diplomatic relations with Argentina. ¶ U.S. forces landed on and occupied Jolo Island in Sulu archipelago.

10. Entire centre of German line on western front caved in as Allied armies raced eastward.

11. 2nd armoured division of U.S. 9th army reached Elbe river at Magdeburg, only 63 mi. from Berlin; other 9th army units captured Essen, while 3rd army forces took Coburg. ¶ Reconnaissance photographs disclosed that German pocket battleship, "Admiral Scheer," was sunk by bombs during R.A.F. attack on Kiel on April 9.



- 12. Franklin Delano Roosevelt died suddenly of brain haemorrhage at his estate in Warm Springs, Ga.; Vice-President Harry S. Truman was sworn in as president.
 - 13. Vienna was captured by soviet armies.
- 14. Marshal Stalin, acceding to request of President Truman, agreed to send Foreign Commissar Vyacheslav Molotov to United Nations conference at San Francisco, White House announced.
- 15. Pres. Roosevelt was buried at his ancestral estate in Hyde Park, N.Y., amid solemn rites.
- 16. Pres. Truman, in first speech before joint session of congress, declared he would carry out Roosevelt's war and peace policies. ¶ U.S. 5th and British 8th armies opened big offensive in northern Italy. ¶ Sinking of "Lützow," German pocket battleship, in Swinemünde harbour by R.A.F. six-ton bombs was claimed by British air ministry.
- 17. Prime Minister Churchill eulogized Franklin D. Roosevelt in commons address as "greatest American friend we have ever known." ¶ John W. Snyder was appointed federal loan administrator by President Truman.
- 18. U.S. 3rd army crossed Czechoslovak border. ¶ Balabac Isle, 45 mi. N. of Borneo, was invaded and captured by U.S. forces.
- 19. Leipzig and Halle were seized by troops of U.S. 1st army. ¶ Most Rev. Geoffrey Francis Fisher was enthroned as 97th archbishop of Canterbury and primate of all England.
- 20. Nuernberg, one-time National-Socialist shrine city, was captured by U.S. 7th army on Adolf Hitler's 56th birthday.
- 21. German broadcasts admitted that Red army tanks had broken into streets of Berlin. ¶ Bologna was captured by U.S., Italian and Polish troops of Allied 5th and 8th armies in Italy.
- 22. U.S. 7th army columns crossed Danube river at Dillingen; capture of Stuttgart and Freiburg by French 1st army was announced by Paris dispatches. ¶ Conclusion of "treaty of friendship, mutual assistance and postwar collaboration" between Russia and Polish provisional government was announced by Moscow radio.
- 23. Capture of Frankfurt-on-Oder by 1st White Russian army was announced by Moscow.
- 24. 1st Ukrainian and 1st White Russian armies joined inside Berlin. ¶ Allied 5th army crossed Po river at several points and captured Modena while British 8th army took Ferrara.
- 25. United Nations conference on international organization opened in San Francisco and Pres. Truman, in radio broadcast, urged conferees to rise above "personal interest" and work together for peace. ¶ Soviet communiqué revealed that Edouard Herriot, famed French statesman, was liberated from prison camp by Russian troops.
- 26. Troops of Gen. Courtney Hodges' U.S. 1st army and Marshal Ivan Konev's 1st Ukrainian army formed junction at Torgau on Elbe river. ¶ Reichsmarshal Hermann Goering was relieved of command as head of luftwaffe, Hamburg radio disclosed. ¶ Allied armies in Italy raced toward Brenner pass after capturing Verona and Parma. ¶ Baltic port of Stettin was stormed and captured by Marshal Rokossovsky's 2nd White Russian army while Marshal Malinovsky's 2nd Ukrainian army occupied Moravian city of Brno. ¶ Gen. Eisenhower ordered Lt. Gen. William H. Simpson's U.S. 9th army to halt at Elbe river to await junction with Red army. ¶ Bremen was occupied by troops of Lt. Gen. Dempsey's British 2nd army. ¶ Marshal Pétain was arrested by French military forces as he crossed from Switzerland into France.
 - 27. Allied 5th army troops, with substantial aid from



Benito Mussolini and his mistress, Clara Petacci, hanging in a public square in Milan after their execution by Italian partisans on April 28, 1945

Italian partisan units, entered Genoa. ¶ Baguio, summer capital of Philippines, was taken by U.S. 33rd and 37th infantry divisions. ¶ United Nations conference in San Francisco agreed to grant soviet union 3 votes in proposed assembly of world security organization.

28. Benito Mussolini, his mistress, Clara Petacci, and several other high-ranking fascist officials were executed by Italian partisan firing squad near Lake Como; their bodies were returned in moving van to Milan where they were strung up by heels in Piazza Loretto for public display. ¶ German retreat in northern Italy turned into headlong rout as U.S. 5th army captured Bergamo and Brescia. ¶ Lt. Gen. Patch's 7th army forces swept across Bavaria and into Austria after 130-mi. advance in nine days. ¶ Capture of Marshal Rodolfo Graziani, commander of fascist armed forces in northern Italy, was disclosed.

29. Milan was captured by Lt. Gen. Lucian K. Truscott's U.S. 5th army; Padua fell to Lt. Gen. Richard L. McCreery's British 8th army. ¶ Austrian provisional government headed by Dr. Karl Renner, Social Democrat, was established in Vienna under soviet sponsorship, Tass news agency dispatch disclosed. ¶ U.S. 7th army troops broke into Munich and British 2nd army forces crossed Elbe river southeast of Hamburg. ¶ 32,000 inmates of notorious Dachau concentration camp were freed by U.S.

forces. ¶ Machinato airfield on Okinawa's west coast was captured by U.S. infantry forces.

30. Undersec'y of State Joseph C. Grew said U.S. did not recognize new Austrian regime set up in Vienna. ¶ "Virtual elimination" of German armies in Italy was announced by Gen. Mark Wayne Clark, Allied ground commander. ¶ United Nations delegates voted 31 to 4 to invite Argentina to attend parley in San Francisco, despite Russian protest. ¶ Sugar ration in U.S. was cut another 25% as sugar reserves hit "rock bottom."

MAY, 1945

- 1. Hamburg radio declared Adolf Hitler had died at his post in reichschancellery in Berlin; Grand Admiral Karl Doenitz proclaimed himself new fuehrer of Germany. § Gen. Mark W. Clark's forces established junction with Marshal Tito's Yugoslav armies at Monfalcone, northwest of Trieste. § Braunau, Hitler's birthplace, was reached by U.S. 3rd army columns sweeping through Austria; U.S. 7th army occupied all of Munich. § Invasion of Tarakan Island off Borneo by Australian troops was announced by Australian government.
- 2. Berlin was captured by Russian armies which also seized ports of Rostock and Warnemünde. ¶ Capture of Field Marshal Karl von Rundstedt in Bad Tolz by U.S. 7th army was announced in Paris. ¶ Hostilities in Italy ended officially at noon in agreement with terms of unconditional surrender signed by Germans April 29 at Allied headquarters in Caserta. ¶ Pres. Truman announced that Robert E. Hannegan would replace Frank C. Walker as postmaster general as of June 30. ¶ Pierre Laval arrived in Barcelona in German military plane and was placed under arrest by Spanish authorities.
- 3. Russian and British forces linked up on 65-mi. front south of Baltic. ¶ Rangoon was captured by British 14th army.
- 4. All German forces in Netherlands, northwest Germany and Denmark, including Helgoland and Frisian Islands, surrendered to Field Marshal Montgomery's 21st army group. ¶ All Slovakia was cleared of nazi forces by Russian armies. ¶ Lt. Gen. Patch's U.S. 7th army drove through Brenner pass and joined up with U.S. 5th army after capturing Berchtesgaden, Salzburg and Innsbruck.
- 5. Army group G of wehrmacht, totalling between 200,000 and 400,000 men, surrendered to Gen. Jacob L. Devers' 6th army group, with capitulation effective as of noom May 6. ¶ Swinemünde, last big German-held port on Baltic, was captured by soviet troops. ¶ U.S. war department announced plans to discharge some 2,000,000 men from army after fall of Germany and to send 6,000,000 selected troops against Japan. ¶ Russian Foreign Commissar Molotov disclosed that 16 Polish underground leaders had been arrested by soviet authorities on charge of "diversionist activities against Red army." ¶ Paul Reynaud, Edouard Daladier and Generals Maurice Gamelin and Maxime Weygand were freed by U.S. troops from imprisonment in Itter, Austria.
- 6. Plzen (Pilsen) and Karlsbad in Czechoslovakia were taken by Gen. Patton's 3rd army troops.
- 7. Germany surrendered unconditionally to western allies and soviet union at 2:41 A.M. in Gen. Eisenhower's headquarters at Reims, France, thus ending European phase of World War II. ¶ Edward Kennedy, Associated Press correspondent, was suspended by Allied supreme headquarters on charges that his premature announcement of Germany's surrender violated pledge he had made not

- to release story until authorized. ¶ Capture of Breslau and its garrison of 40,000 German troops was announced in Russian communiqué. ¶ All German U-boats were ordered to cease fighting by Adm. Doenitz.
- 8. Unconditional surrender of Germany was formally ratified in Berlin. ¶ Pres. Truman officially announced unconditional surrender but added that only when last Japanese division surrendered would "our fighting job be done." ¶ Prime Minister Churchill formally proclaimed end of war in Europe, but warned that Japan still remained to be beaten. ¶ Crown Prince Olaf returned to Oslo and proclaimed surrender of all German forces in Norway.
- 9. Reichsmarshal Hermann Goering gave himself up to U.S. 7th army, it was disclosed in Paris; Field Marshal Albert Kesselring and Gen. Franz von Epp were captured by U.S. forces. ¶ Vidkun Quisling and several of his cabinet members surrendered to Oslo police and were immediately imprisoned.
- 10. U.S. army set up point system based on length of service, combat record and parenthood which was to determine eligibility for demobilization.
- 11. Gen. Eisenhower ordered that no combat soldiers who had fought in both North Africa and Europe were to be sent to Pacific. ¶ Two Japanese Kamikaze planes crashed on deck of U.S. aircraft carrier "Bunker Hill," causing 656 casualties.
- 12. Yugoslavia's action in occupying Trieste was denounced by U.S. Undersec'y of State Joseph C. Grew as "sudden unilateral" action running counter to Yalta accord.
- 14. Austrian provisional government declared its independence, abolished all nazi decrees and restored republican laws.
- 16. U.S. military government would apply policy of hard realism in administering its occupation zone of Germany, Lt. Gen. Lucius D. Clay, deputy military governor, disclosed.
- 18. Deportation of Fritz Kuhn, one-time leader of German-American bund in U.S., to Germany was announced by U.S. department of justice.
- 19. Chungking communiqué said Chinese troops had reoccupied port of Foochow.
- 21. Tension over Trieste dispute was relaxed when Yugoslav partisan forces evacuated Carinthia and Styria in Austria.
- 23. Pres. Truman reorganized cabinet; Thomas C. Clark succeeded Francis Biddle as attorney general; Lewis B. Schwellenbach succeeded Frances Perkins as secretary of labour; Rep. Clinton P. Anderson succeeded Claude Wickard as secretary of agriculture. ¶ Prime Minister Churchill and his cabinet resigned when Labourites refused to continue in wartime coalition cabinet; King George VI reappointed Churchill as prime minister; dissolution of parliament as of June 15 and general elections as of July 5 were announced. ¶ Adm. Doenitz' government was dissolved by Allied authorities; Doenitz, other members of his government and general staff were placed under arrest. ¶ Heinrich Himmler, nazi gestapo chieftain and interior minister who had been captured by British army troops, ended his life by swallowing poison.
- 25. Estimated 111 Japanese planes were shot out of air in Okinawa battle theatre in 48-hr. period by U.S. forces after enemy attack which caused damage to 11 light naval units. ¶ Prime Minister Churchill revised cabinet to fill vacancies caused by resignation of Labourite members.
- 27. Chinese troops recaptured inland treaty port of Nanking, Chungking announced. ¶ Adm. William F. Halsey's

- 28. Yokohama was raided for first time by superfortresses.
- 29. Damascus was shelled by French mortars as clashes between French troops and natives spread in Syria.
- 30. Shuri castle, keystone of Japanese defense line in Okinawa, was captured by U.S. marines. ¶ Maj. Gen. Curtis LeMay disclosed that 51 sq.mi. of Tokyo had been laid waste by six superfortress attacks. ¶ Iran government asked U.S., Britain and Russia to withdraw troops from country as war in Europe was over.
- 31. Prime Minister Churchill informed Gen. de Gaulle that British forces had been instructed to "intervene" in Levant states to end bloodshed and avoid threat to Allied lines to Pacific.

JUNE, 1945

- 1. Pres. Truman said that U.S. would have army of 7,000,000 men to hurl against Japan by 1946. ¶ City of Shuri was captured by U.S. 10th army on Okinawa. ¶ Gen. de Gaulle disclosed that he had ordered French troops in Levant to cease fire in compliance with British request.
- 2. Russian delegates insisted that permanent members of proposed United Nations council have right to veto discussion of international disputes.
- 4. Prime Minister Churchill opened electioneering campaign warning that a Labour government would establish totalitarian state employing some form of gestapo.
- 5. U.S., British, Russian and French commanders in chief "assumed supreme authority" over defeated Germany. ¶ Gen. de Gaulle's accusation of British meddling in Levant states was denied by Prime Minister Churchill who said British sought no territorial or other advantages in that zone.
- 7. Gen. Omar N. Bradley was designated to succeed Brig. Gen. Frank T. Hines as administrator of veterans' affairs.
- 9. Temporary tripartite military administration of Venezia Giulia, including Trieste, was agreed upon by U.S., Britain and Yugoslavia, state department announced. ¶ Marshal Zhukov said Adolf Hitler had married Eva Braun two days before Berlin's fall and that Russians "found no corpse that could be Hitler's." ¶ Premier Kantaro Suzuki stated Japan would fight to last rather than accept unconditional surrender. ¶ Disclosure that nazis had exterminated at least 80% of Germany's Jews was made by Allied military government authorities in Frankfurton-Main. ¶ Hoop, Jr., won Kentucky Derby.
- 10. Australian troops landed at four points on north-western Borneo in Brunei bay area.
- 11. Liberal party won heavy majority in Canadian elections, returning Prime Minister Mackenzie King's government to office.
- 14. Yaeju hill, key point in Japanese defenses on Okinawa, was captured by U.S. forces. ¶ Town of Brunei in northern Borneo was seized by Australian troops.
- 15. Clement Attlee, British Labour leader, accepted Prime Minister Churchill's invitation to attend Big Three parley in Potsdam as "friend and counsellor." ¶ Truk Island was shelled and bombed over 48-hr. period by units of British Pacific fleet.
- 16. Cabinet of Premier Achille van Acker resigned in protest over projected return of King Leopold to Belgium's throne.
- 18. Chungking communiqué announced that Chinese troops had recaptured port of Wenchow. ¶ Ruling that membership bylaws of Associated Press violated Sherman

antitrust act was upheld by supreme court. ¶ Order to deport Harry Bridges, west coast labour leader, was ruled illegal in supreme court decision.

- 19. Estimated 4,000,000 New Yorkers jammed line of march to welcome Gen. Eisenhower as he visited city.
- 21. Okinawa fell to U.S. 10th army after gruelling 82-day battle. ¶ Soviet court sentenced 12 of 16 Polish underground leaders, convicted of subversive activities, to prison terms ranging from 4 months to 10 years; 3 were acquitted and trial of fourth was postponed.
- 22. Gen. Joseph W. Stilwell was made commander of U.S. 10th army, succeeding Gen. Simon Bolivar Buckner, Jr., who had been killed in action, MacArthur announced. New Polish regime was formed in Moscow with Edward Osubka-Morawski as premier and Stanislaw Mikolajczyk as vice-premier.
- 23. Disclosure that U.S., Russia, Britain and China had agreed to permit entry of new Polish government into projected world league was made by Sec'y of State Stettinius.
- 24. Gen. Arnold asserted that U.S. must retain island air bases in Pacific for own defense.
- 25. Leo T. Crowley, foreign economic administrator, revealed that U.S. was continuing to supply Russia with lend-lease goods via Siberian ports.
- 26. United Nations concluded conference at San Francisco and each of its members signed charter designed to ensure lasting peace.
- 27. Edward J. Stettinius resigned as secretary of state and was named U.S. member of United Nations security council and chairman of U.S. delegation on general assembly.
- 28. Liberation of Luzon was announced by Gen. MacArthur after U.S. forces split last Japanese force in Cagayan valley into three isolated segments.
- 29. Ruthenia was ceded to Russia in agreement drawn up by Czechoslovak and soviet governments. ¶ Three German civilians, convicted by U.S. military court of slaying U.S. airman in Aug. 1944, were hanged by U.S. army executioners.
- 30. House of representatives voted 255 to 94 to continue OPA for another year and measure was speeded to Pres. Truman for signature. ¶ James F. Byrnes was named by Pres. Truman as secretary of state. ¶ Liuchow, former U..S air base in China, was recaptured from Japanese by Chinese troops.

JULY, 1945

- 1. Australian troops landed at Balikpapan, east Borneo oil centre.
- 2. Pres. Truman submitted United Nations charter to senate and urged that body ratify it quickly as only way to achieve enduring peace. ¶ Comdr. Harold E. Stassen said world peace lasting at least 50 years could be achieved if U.S. adopted wise course in its foreign policy.
- 3. U.S. and British troops began entering their respective zones of occupation in Berlin. ¶ Sec'y of State Byrnes asserted there would be no change in basic foreign peace policies as charted by Pres. Roosevelt.
- 5. Gen. MacArthur announced entire Philippines campaign could be regarded as closed, but admitted there would be isolated guerrilla action. ¶ Recognition of new Polish government of national unity sitting in Warsaw was announced simultaneously in Washington and London. ¶ U.S. military government seized assets and 24 plants of I.G. Farbenindustrie in its zone of occupation for ultimate disposition by four Allies ruling Germany. ¶ Henry

Morgenthau, Jr., resigned as secretary of treasury.

- 6. ODT issued order banning civilians from sleeping cars between points less than 450 mi. apart. ¶ Nicaragua became first nation to ratify United Nations charter.
- 10. Japanese home islands were attacked by estimated 2,000 army, navy and marine aircraft.
- 12. Compromise legislation designed to continue Fair Employment Practices committee for another year was voted by both houses of congress. ¶ Joseph Benedict Chifley was elected prime minister of Australia on first ballot by parliamentary Labour party.
- 13. U.S. government admitted full responsibility for sinking of Japanese relief ship "Awa Maru" and informed Japanese government it would discuss indemnity after war's end. ¶ Supreme headquarters, Allied expeditionary force, at Frankfurt-on-Main, were dissolved by Gen. Eisenhower.
- 14. Warships of U.S. Pacific fleet bombarded Japanese mainland for first time, hitting targets on northern Honshu and Hokkaido Islands. ¶ Soviet union and China reached understanding on many important questions, said Russo-Chinese joint communiqué issued in Moscow. ¶ Gen. Eisenhower relaxed order forbidding fraternization between U.S. soldiers and German civilians. ¶ Viscount Wavell, viceroy of India, declared Simla parley envisaging British proposals for greater Indian self-government had failed and assumed blame for failure.
- 15. Prime Minister Achille van Acker disclosed that King Leopold had informed Belgian leaders that he would neither return to Belgium nor abdicate throne.
- 17. British carrier task force joined U.S. 3rd fleet in attack "in great strength" on targets in Tokyo area. ¶ Pres. Truman was selected by Prime Minister Churchill and Premier Stalin to preside over Big Three conference that opened in Potsdam. ¶ Restoration of "traditional" monarchy at some future date was promised to Spain by Generalissimo Francisco Franco.
- 20. Pres. Truman, in speech at raising of U.S. flag in Berlin, said U.S. prime goal was to bring peace and prosperity to world. § Both houses of congress passed (1) Bretton Woods bill, (2) measure to increase Export-Import bank's lending authority from \$700,000,000 to \$3,500,000,000.
- 22. Domei news agency said Japan would be amenable to "fair arguments" in discussing peace proposals but would not be "intimidated" by threats, according to broadcast heard by FCC. ¶ State department disclosed that Japan had agreed to permit neutral observers to inspect its prisoner-of-war camps.

23. Fred M. Vinson was sworn in as secretary of treasury, succeeding Henry Morgenthau, Jr.

- 24. Two Japanese battleships and two cruisers were damaged by U.S. and British airmen of U.S. 3rd fleet's carrier forces that bombed Japanese naval base of Kure and other enemy anchorages in Inland sea. ¶ Maj. Gen. Curtis E. LeMay was named chief of staff to Gen. Carl Spaatz, commander of U.S. strategic air force in Pacific.
- 26. Churchill government was defeated in general elections by overwhelming Labourite majority; Clement R. Attlee became prime minister and pledged full co-operation in war against Japan. ¶ Pres. Truman and retiring Prime Minister Churchill, with concurrence of Generalissimo Chiang Kai-shek, called on Japan to accept unconditional surrender or face "prompt and utter destruction." ¶ Belgian chamber of deputies gave Premier Achille van Acker 95 to 68 vote of confidence.

- 27. Prime Minister Attlee appointed six Labour party leaders to his cabinet: Ernest Bevin was named foreign secretary; Arthur Greenwood, lord privy seal; Hugh Dalton, chancellor of exchequer; Herbert Morrison, lord president of council; Sir Stafford Cripps, president of board of trade; and Sir William Jowitt, lord chancellor. ¶ Chinese forces recaptured Kweilin, former U.S. air base city, Chinese high command asserted.
- 28. United Nations security charter was ratified by U.S. senate by 89 to 2 vote; Pres. Truman said senate approval of document advanced "cause of world peace." ¶ Earl Browder was formally deposed as president of Communist Political association and was replaced by William Z Foster.
- 29. U.S. cruiser "Indianapolis" was torpedoed and sunk by Japanese submarine; 880 men and officers were lost and 316 survivors were officially listed as casualties.
- 30. T. V. Soong resigned as foreign minister of China but retained concurrent post of premier; Wang Shih-chieh replaced Soong as foreign minister.
- 31. Pierre Laval, former Vichy chief, flew from Barcelona to Linz, Austria, where he surrendered to U.S. army. § Field Marshal Sir Harold R. L. G. Alexander was appointed by King George VI as governor general of Canada to succeed Earl of Athlone.

AUGUST, 1945

- 2. Agreement on measures (1) to reduce German industrial power to subsistence levels; (2) to permit Poland and soviet union to annex East Prussia and large part of eastern Germany and (3) to establish reparations scales was reached by Pres. Truman, Premier Stalin and Prime Minister Attlee at Berlin conference. ¶ 6,000 tons of explosives and incendiaries were dropped on four Japanese cities and oil centres by some 800 superfortresses.
- 3. Pres. Truman asserted no "secret agreements of any kind" were made at Big Three conference in Berlin.
- 6. First atomic bomb, said to have destructive force of more than 20,000 tons of T.N.T., was dropped on Japanese city of Hiroshima by U.S. plane. ¶ Pres. Truman asserted U.S. was prepared to obliterate with atomic explosives every major Japanese city unless Japan acceded to Potsdam ultimatum.
- 7. Marshal Josip Broz (Tito) told Yugoslav national assembly that "outmoded" monarchy was repudiated by majority of Yugoslavia and that King Peter would be barred from returning.
- 8. Soviet union declared war on Japan; Foreign Commissar Molotov declared Russia joined war against "Japanese aggression" to shorten conflict, reduce number of victims and facilitate early restoration of peace. ¶ Fourpower occupation machinery for rule of Austria was set up by U.S., Russia, Britain and France; system divided Austria, as well as Vienna, into four zones of occupation.
- 9. U.S. air forces dropped second atomic bomb on Japan; target for this attack was city of Nagasaki. ¶ Russia's far eastern army began hostilities at 12:10 A.M., launching strong drives against Japanese forces along eastern Soviet-Manchurian border.
- 10. White House announced that Japan had offered to surrender and that terms were being studied by U.S., Britain, Russia and China.
- 11. Pres. Truman said Allies agreed to Japanese surrender proposal on basis of Potsdam ultimatum, provided Hirohito submitted to authority of Allied commander in chief.
- 12. Chiang Kai-shek criticized "independent action" by Chinese communist commanders and instructed China's



Makeshift home set up by a Japanese family in Nagasaki on the site of their previous dwelling. The second atomic bombing of Japan, on Aug. 9, 1945, left an estimated 90,000 homeless in the city in addition to those who suffered death or injury

communist troops to remain at their posts and await further orders. ¶ Prime Minister Attlee said British would co-operate with Pres. Truman's proposal to keep secret of atomic bomb until complete control of weapon was assured.

13. U.S. 3rd fleet carrier planes resumed attacks on Tokyo area as Japanese government officials pondered Allied surrender terms. ¶ Program requesting establishment of Jewish state in Palestine, which was submitted to British government in May, was disclosed by World Zionist conference.

14. Japan accepted Allied unconditional surrender terms. ¶ Moscow radio disclosed China and soviet union signed friendship treaty. ¶ Marshal Pétain was sentenced to death with recommendation for mercy by Paris court after conviction on charges of intelligence with enemy. ¶ War Manpower commission abolished all manpower controls over employees, enabling employers to hire men at their discretion.

15. Emperor Hirohito broadcast to his subjects first announcement of Japan's decision to accept Allied unconditional surrender terms. ¶ Japanese cabinet of Premier Kantaro Suzuki resigned. ¶ Broad outlines of plans to speed up demobilization were announced by U.S. army, navy and marine corps. ¶ Government ownership of Bank of England and nationalization of mines were stressed in King George's address opening new Labour parliament.

16. Japanese army in Manchuria was ordered by Marshal Alexander Vasilevsky, commander of soviet far eastern armies, to surrender by Aug. 20. ¶ Seven wartime controls over commercial motor traffic were lifted by ODT.

¶ Relaxed wage controls were announced by Pres. Truman who urged labour and management to renew nostrike, no-lockout pledge until adequate substitute for WLB could be established. ¶ Joseph C. Grew resigned as undersecretary of state and Dean G. Acheson was named to succeed him. ¶ Soviet union and Poland signéd treaty which fixed new Russo-Polish frontier and which determined how they would share German reparations.

17. Prince Naruhiko Higashi-Kuni formed new Japanese cabinet which was sworn in at imperial palace. ¶ Gen. de Gaulle commuted death sentence imposed on Marshal Pétain to life imprisonment.

18. Pres. Truman vested OPA, WLB and department of agriculture with broad authority to take "vigorous action" to restore maximum production of civilian goods, collective bargaining and free markets.

19. Gen. Jonathan M. Wainwright was located by U.S. army parachute squad which landed at Japanese prisoner-of-war camp deep in Manchuria, it was disclosed in Chungking.

20. Ernest Bevin, British foreign secretary, in first speech before commons, said he would oppose any attempts to substitute one form of "totalitarianism" for another in Europe. ¶ WPB cancelled 210 controls which had restricted production of certain categories of consumers' goods in wartime.

21. Adm. Nimitz announced that all but 55 of Japan's 382 warships were damaged or destroyed by U.S. air and sea power during war. ¶ Pres. Truman ordered halt of lend-lease operations to all Allied governments.

22. Domei dispatch said atomic bombings killed 70,000 persons, wounded 120,000 others and left 290,000 homeless. ¶ Agreement to establish provisional international regime to govern Tangier was announced by U.S., Rus-

sian, British and French experts convening in Paris.

- 23. United Nations charter was ratified without dissenting vote by both houses of British parliament. ¶ Premier Stalin announced that Red army had won complete victory over Japanese in Manchuria and that fighting in that area had ended. ¶ British, U.S. and French troops formally entered Vienna to share in occupation of Austrian capital with soviet armies.
- 24. Prime Minister Attlee told house of commons that abrupt termination of lend-lease left Britain in "very serious financial position"; in Washington, FEA Administrator Leo T. Crowley disclosed six-point program to enable Britain to bridge transition, but asserted British well knew that lend-lease had to end with finish of war. \(\) WPB removed all controls on output of passenger motor cars. \(\) Britain was accused of denying Australia "equality of footing" in Japanese peace discussions by Herbert Vere Evatt, Australian minister of external affairs.
- 25. Nelson Rockefeller resigned as assistant secretary of state and was replaced by Spruille Braden, W.S. ambassador to Argentina. ¶ Pres. Truman and Gen. de Gaulle, in joint statement at White House, asserted their talks showed existing "fundamental harmony" between France and U.S. ¶ Bulgaria yielded to Allied recommendation to delay scheduled elections to democratize more thoroughly voting procedure.
- 26. Chinese nationalist forces entered Shanghai and Nanking, Chungking announced.
- 27. Congress was urged by Pres. Truman to continue draft of men between 18 and 25 for military service because of world crisis and to release veteran combat soldiers.
- 28. Mao Tse-tung, Chinese communist leader, arrived in Chungking for conference with Chiang Kai-shek designed to avert civil war. ¶ Occupation of Japan was begun by a force of about 150 U.S. soldiers who landed at Atsugi airfield.
- 29. Hermann Goering, Joachim von Ribbentrop, Hjalmar Schacht and 21 other nazi civilian and military leaders were indicted by Allied jurists as war criminals. ¶ Findings of army and navy inquiry boards on Pearl Harbor attack were released by Pres. Truman; probes indicated that lack of preparedness, confusion and lack of co-ordination between services combined to cause U.S. defeat in first blow of World War II; criticism of Gen. Marshall in army report was branded as "entirely unjustified" by Sec'y of War Stimson.
- 30. Gen. MacArthur landed in Japan and set up temporary headquarters in Yokohama. ¶ Government reduced red-point ration value for meat, cheese and fat. Pres. Truman urged congress to achieve equitable solution of lendlease debts. ¶ Pres. Truman asserted that country itself was just as much to blame as its military leaders for lack of preparedness that resulted in Pearl Harbor disaster.
- 31. Office of War Information was abolished by Pres. Truman who transferred some of its functions to state department. ¶ Sec'y of State Byrnes declared assumption that entire lend-lease debt to Allies would be cancelled was unjustified and warned against "generalizations" in connection with Pres. Truman's earlier lend-lease statement.

SEPTEMBER, 1945

- 1. Pres. Truman proclaimed Sept. 2 as V-J day.
- 2. World War II was officially ended as Japanese envoys signed formal surrender documents aboard U.S.S. "Missouri" anchored in Tokyo bay; Foreign Minister Mamoru

- Shigemitsu signed for Japanese government and Gen. MacArthur for Allies. ¶ Premier Stalin announced that defeat of Japan enabled Russians to regain southern half of Sakhalin Island and Kurile chain, both wrested from Russia in Russo-Japanese War of 1904. ¶ Japanese garrisons in Palau group, Truk, Rota and Pagan Islands surrendered to U.S. commanders.
- 3. Generalissimo Chiang Kai-shek declared that political armies would not be tolerated within China's borders.
 ¶ Gen. Tomoyuki Yamashita surrendered remnants of his Japanese army in Philippines to Gen. Jonathan M. Wainwright.
- 4. Gen. MacArthur issued directive instructing Japanese to speed demobilization of their armed forces. ¶ Japanese garrison on Wake Island surrendered to U.S. forces. ¶ Disclosure that U.S. had given tacit agreement to return of Sakhalin and Kurile Islands to soviet union was made by Sec'y of State Byrnes. ¶ Emperor Hirohito personally opened Japanese diet session with appeal to his people to "win confidence of world," and set up peaceful state. ¶ British dominions office in London announced that Lt. Gen. Sir Bernard Freyberg had been appointed governor general of New Zealand.
- 5. State department report accused Japanese of massacring, torturing and starving U.S. prisoners and asserted Japanese government virtually ignored 19 U.S. protests against atrocities. ¶ U.S. navy urged coppress to retain chain of nine bases won in Pacific and to establish six bases in Atlantic. ¶ Pres. Truman appointed Benjamin V. Cohen as counsellor in state department and Donald S. Russell and William Benton as assistant secretaries of state.
- 6. A 21-point legislative program, designed to achieve "as full peacetime production and employment as possible in most efficient and speedy manner," was contained in Pres. Truman's message to congress. ¶ Sinclair Oil corporation announced it had received 50-year concession from Ethiopia to develop country's oil resources. ¶ Paul V. McNutt was named high commissioner to Philippines.
- 8. Sec'y of Navy Forrestal objected to full disclosure of all Pearl Harbor facts on grounds it would compromise "sources of information" vital to national security.
- 9. Gen. MacArthur, outlining policy for ruling Japan, emphasized that he was over-all authority but that people and emperor would be permitted reasonable self-rule under Allied directives. ¶ Large contingents of U.S. troops marched into Tokyo as other U.S. forces landed in Korea and other sections of Japan and Japanese empire. ¶ Gen. Yasuji Okamura surrendered 1,000,000 Japanese troops to Gen. Ho Ying-chin, Chinese chief of staff in Nanking ceremony. § Lt. Gen. John R. Hodge received formal surrender of Japanese troops in U.S. occupation zone of Korea, and retained Japanese administrators in office to carry out his directives. ¶ Canada resumed meat rationing to assure adequate supplies for export to United Kingdom and liberated countries. ¶ Recommendation that U.S. share secret of atomic bomb was sent to Pres. Truman by 64 faculty members and research scientists of University of Chicago.
- 10. Emperor Hirohito was ordered by Gen. MacArthur to abolish Japanese imperial general headquarters as of Sept. 12. ¶ Foreign ministers of five Allied powers opened conference in London. ¶ Vidkun Quisling, Norwegian nazi, was sentenced to death in Oslo court for high treason.
- 12. Francis Biddle was appointed U.S. judge on board of international tribunal to try axis war criminals.
- 14. Premier Stalin, in interview with Sen. Pepper, asserted principal objectives of soviet union were to repair

war damages, rebuild industrial strength and raise standard of living. ¶ Ford Motor company virtually stopped production in all its plants because unauthorized strikes crippled output schedules.

18. Henry L. Stimson resigned as secretary of war and Pres. Truman designated Robert P. Patterson as his successor. ¶ Sen. Harold H. Burton of Ohio was named by Pres. Truman to supreme court. ¶ Pres. Truman placed War Labor board, U.S. Employment service and War Manpower commission under Sec'y of Labor Schwellenbach; and also merged Office of Economic Stabilization and Office of War Mobilization and Reconversion with John W. Snyder as over-all head.

19. Dean G. Acheson, undersecretary of state, asserted that U.S. government, not Gen. MacArthur's occupation forces, would determine policy on Japan. ¶ People of India were promised by Prime Minister Attlee that positive measures would be taken immediately after Indian elections to assure them full self-rule. ¶ William Joyce, who worked for nazis as radio broadcaster and was known to British as "Lord Haw Haw," was sentenced to be hanged for treason after three-day trial in Old Bailey. ¶ Eric A. Johnston succeeded Will H. Hays as president of Motion Picture Producers and Distributors of America, Inc.

22. Document issued by White House dated Sept. 9 called for strong political, economic and military curbs to eliminate Japan as menace to world peace. ¶ Japanese government was ordered to furnish U.S. authorities with complete data on its banks, insurance companies and imperial household finances. ¶ Gen. George S. Patton, Jr., declared in interview that he had "never seen necessity of denazification program" and compared "this nazi thing" to "Democratic and Republican election fight."

23. Withdrawal of British troops and incorporation of Anglo-Egyptian Sudan into Egypt was demanded by cabinet of Premier Mahmoud Nokrashy Pasha.

24. Strike of elevator operators of more than 2,000 buildings in Manhattan paralyzed commercial activity in New York's skyscraper district. ¶ Anglo-U.S. oil pact was signed in London by Harold L. Ickes, U.S. petroleum administrator, and Emanuel Shinwell, Britain's fuel minister.

25. Congress was asked by Pres. Truman to slash more than \$28,500,000,000 from war department's appropriations. ¶ Nazi party was declared illegal and abolition of all German armed forces as well as semi-military organizations was decreed in new Allied proclamation.

26. State of siege was revived in Argentina after government initiated wave of arrests in move to squelch growing discontent with totalitarian Perón government. ¶ Letter written by Pres. Roosevelt March 10 in which he said Spain could expect no help from U.S. as long as totalitarian Franco regime remained in power was made public by state department.

27. Emperor Hirohito shattered precedent and paid a visit to Gen. MacArthur. ¶ Foreign Economic administration was abolished by Pres. Truman.

28. War department announced that Gen. Wainwright had been named commander of east defense command.

29. Gen. Eisenhower urged that four Allied occupation powers take steps to prevent economic chaos in reich by bringing that nation to solvency at subsistence level. ¶ Survey asserting that U.S. occupation authorities in reich "appeared to be treating Jews as nazis treated them, except that we do not exterminate them," was made public by Pres. Truman; survey was made by Earl G. Harrison, U.S. representative on Inter-Governmental Committee on Refugees, after inspecting camps of displaced persons in

Germany. Pres. Truman acting on Harrison report directed Gen. Eisenhower, in letter dated Aug. 31, to alleviate "shocking" treatment of displaced Jews in Germany.

OCTOBER, 1945

1. All restrictions on fraternizing between Allied soldiers and Germans, save for certain bans on intermarriage, were relaxed by Allied control council.

2. Gen. Eisenhower's headquarters announced removal of Gen. Patton as U.S. 3rd army commander in Bavaria; Patton was replaced by Lt. Gen. Lucian K. Truscott, Jr. ¶ Council of five foreign ministers in London terminated parley with no accord on any major issues.

3. Prompt creation of atomic energy commission to regulate all phases of nuclear energy was urged by Pres. Truman in special message to congress. ¶ Foreign Commissar Vyacheslav Molotov of U.S.S.R. ascribed stalemate of council of foreign ministers to refusal of other delegates to accept soviet compromise plan to continue discussions. ¶ U.S. refusal to associate itself with Argentina because of latter's repudiations of international obligations resulted in postponement of Rio de Janeiro parley for concluding hemispheric military alliances.

4. Strike-bound properties of 26 oil-producing and refining firms were taken over by navy on Pres. Truman's orders. ¶ Batavia dispatches said Indonesian nationalists had taken over Surabaya and other Javanese cities.

5. Sec'y of State Byrnes attributed much of disagreement at council of foreign ministers to Russia's suspicions of western Allies.

6. Chinese communists charged Chiang Kai-shek's armies had attacked them, with Japanese aid, in communist-controlled territory of central China. ¶ Baron Kijuro Shidehara formed new Japanese cabinet and pledged full co-operation with Allied military authorities. ¶ Sir Walter Citrine was elected president of World Federation of Trade Unions.

8. Pres. Truman declared U.S. had no intention of disclosing to any other nation industrial secrets in manufacturing atomic bomb.

9. Warning that U.S. would court "disaster" if it disarmed was sounded by Gen. Marshall in his biennial report. ¶ Col. Juan Perón was compelled to resign all of his government posts by uprising of army forces in Argentine military base at Campo de Mayo.

10. Detroit Tigers defeated Chicago Cubs 9 to 3, thus winning baseball's world series by four games to three. ¶ New constitutional status for British Malaya, which would merge Malay states and Straits Settlements into a Malayan union and make Singapore independent colony, was announced by British colonial office.

11. Gen. MacArthur presented Premier Shidehara with five-point program designed to democratize Japanese institutions.

12. Gen. Anton Dostler of German general staff was sentenced to death by U.S. military court in Rome for ordering shooting of 15 U.S. soldiers without trial in March 1944. ¶ Announcement that members of nazi party would be deprived of vote was made by Gen. Eisenhower. ¶ Canadian income tax cut of 16% was among five important tax reductions announced by Finance Minister J. L. Ilsley.

13. 400 scientists at Los Alamos government laboratory warned in signed statement that efforts to keep secret of atomic bomb would lead to "unending war more savage than last." ¶ Indonesian people's army issued proclama-

tion calling for all-out guerrilla warfare in Batavia area of Java.

- 14. Allied armies took over Batavia and declared looting, sabotage and bearing of arms would be punishable by death.
- 15. Pierre Laval was executed by firing squad after his attempt to cheat executioners by taking poison failed.
- 17. Coal strike was ended at order of John L. Lewis, president of United Mine Workers of America. ¶ Col. Juan Perón was released by army and returned to Argentine political scene in former role as "strong man" of Farrell regime. ¶ Archbishop Damaskinos ended prolonged cabinet crisis in Greece by taking over government as provisional president.
- 18. Indictment of 24 nazi war leaders of Hitler's reich on charges of plotting against world peace was presented before international military tribunal. ¶ Sec'y of State Byrnes said U.S. would make no final decision affecting Palestine without prior and full consultation with both Arabs and Jews. ¶ International machinery to prevent rate wars was set up by 57 world air lines in Montreal conference. ¶ Port strike in New York was ended by National Maritime union after 18 days.
- 19. R.A.F. Marshal Sir Arthur W. Tedder was appointed chief of air staff and senior member of air council, succeeding retiring R.A.F. Marshal Lord Portal, British air ministry announced.
- 20. Chancellor Karl Renner's regime was recognized as de facto provisional government of Austria by Allied control council. ¶ Achmed Soekarno, Indonesian leader, called upon Pres. Truman to stop Netherlands from using lendlease equipment to put down Indonesian independence movement.
- 21. Revolutionary government headed by Pres. Romulo Bettancourt won solid control of Venezuela after brief period of civil strife. ¶ Communists emerged as strongest single party in French elections with Socialists and Popular Republican movement close behind.
- 23. Promises of substantial reductions in all categories of taxes were made to British people by Hugh Dalton, chancellor of exchequer.
- 24. United Nations world security organization came into being when soviet union ratified charter, which with legal majority of 29 ratifications became "law of nations." ¶ Vidkun Quisling was executed by Norwegian firing squad.
- 27. Pres. Truman said U.S. would not recognize government forced upon any nation by foreign power and asserted U.S. held atomic bomb as sacred trust. ¶ Netherlands government ordered Dr. Hubertus van Mook, acting governor general of Netherlands Indies, to initiate negotiations with Indonesian nationalists.
- 29. Getulio Vargas resigned as president of Brazil and José Linhares, chief justice of supreme court, assumed role as interim president until election.
- 30. Pres. Truman asserted U.S. industry could afford higher wages without increasing prices, but told labour not to expect as much money as they made during war boom era. ¶ Shoe rationing was ended by OPA. ¶ New Venezuelan government was recognized by U.S.

NOVEMBER, 1945

1. Plans to nationalize all British air transport and empire's communications system were announced by British Labour government. ¶ British intelligence officers said exhaustive investigation suggested that Adolf Hitler had

- married Eva Braun April 29 and that both committed suicide the following day in a bunker in Berlin.
- 2. Several hundred persons were hurt in clashes with police as anti-Zionist mob in Cairo set fire to Jewish shops and a synagogue. ¶ Hungarian provisional government was recognized by the United States.
- 4. Small Landholders party won decisive majority in national and municipal elections in Hungary.
- 5. Pres. Truman opened labour-management conference in Washington with warning that failure to establish broad and permanent basis for industrial peace would mean legislation by congress. ¶ Charges that U.S. troops in China were actively collaborating with Chungking troops in attacks on Chinese communist forces were made by Chinese Communist party organs. ¶ At least 74 Jews were killed and 183 others were injured in outbreak of anti-Semitic riots in Tripoli (Tripolitania) and near-by towns.
- 6. William O'Dwyer, Democratic and American Labor party candidate, was elected mayor of New York city. ¶ Edward J. Jeffries was re-elected mayor of Detroit, defeating Richard T. Frankensteen, C.I.O. candidate.
- 7. World air speed record of 606 m.p.h. was claimed for British jet-plane which made four runs over 70-mi. course off south coast of England.
- 9. C.I.O. members of Ford Motor company voted 42,235 for and 3,951 against strike in support of their 30% wage increase demand, NLRB announced.
- 13. Joint session of U.S. congress heard Prime Minister Attlee warn that world civilization, "in terrible light of atomic bomb," could only survive through strong United Nations organization. ¶ Sutan Sjahrir became premier of unrecognized Indonesian republic; Achmed Soekarno remained as president but his powers were greatly reduced.
- 15. Willingness of U.S., Britain and Canada to share secret of atomic energy with other United Nations as soon as "effective enforceable safeguards against its use for destructive purposes can be devised," was expressed in joint statement by Pres. Truman, Prime Minister Attlec and Prime Minister Mackenzie King. ¶ Investigation of Pearl Harbor attack was opened by joint congressional committee; early disclosures showed that Japanese code fell into U.S. hands as early as Dec. 1940.
- 18. Revolt broke out in northern Iran where Azerbaijan insurgents demanded broader autonomy for their province within framework of existing government.
- 20. Appointment of Gen. Eisenhower as U.S. army chief of staff succeeding Gen. George C. Marshall, and Adm. Nimitz as chief of U.S. naval operations succeeding Adm. Ernest J. King was announced by Pres. Truman; Gen. Joseph T. McNarney was appointed to succeed Eisenhower as commanding general of U.S. forces in European theatre; Adm. Raymond A. Spruance was named to succeed Nimitz as commander in chief of Pacific fleet and Pacific ocean areas. ¶ World's nonstop, nonrefuelling distance record of 8,198 mi. was achieved by B-29 flying from Guam to Washington, D.C., in 35 hr. 5 min.
- 21. United Automobile Workers (C.I.O.) called scheduled strike halting work in all General Motors Corp. plants throughout the U.S. J Justice Robert H. Jackson, opening prosecution against 20 top-ranking nazis on trial as war criminals at Nuernberg charged Germany had plotted war against U.S. in 1940. J Pres. de Gaulle and communists reached agreement as former set up national union cabinet which included communist representatives.
- 22. Work of U.N.R.R.A. was praised by Gen. Eisenhower who urged congress to appropriate adequate funds

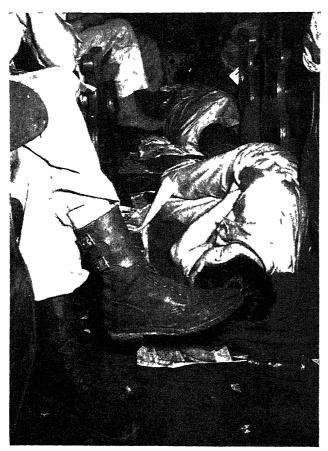
to feed starving people of liberated Europe. ¶ Japanese troops under British command battled Indonesian nationalists in Java city of Semarang.

- 23. Rationing of meat, butter and all other red-point foods was ended in U.S.
- 24. Ferruccio Parri resigned as Italy's premier, with warning to his successor to "beware of civil war" and recrudescence of fascism.
- 25. Conservative People's party won more than half of 165 seats in Austrian national assembly in first free national election in more than decade.
- 26. Proposal that soviet, British and U.S. troops be withdrawn from Iran by Jan. 1 was announced by U.S. government.
- 27. Patrick J. Hurley resigned as ambassador to China and criticized professional and career diplomats whom he alleged were sabotaging U.S. foreign policy; Pres. Truman appointed Gen. George C. Marshall as special envoy to China with rank of ambassador. ¶ Uruguayan proposal for collective hemispheric intervention to prevent establishment of oppressive regimes was given "unqualified adherence" by U.S. government, Sec'y of State Byrnes announced. ¶ Cordell Hull branded as false and "infamous" army report on Pearl Harbor that said he had "touched the button that started the war" with Japan.
- 28. Ford Motor company asked United Automobile Workers (C.I.O.) to agree to pay \$5 a day for each employee who took part in an illegal strike. ¶ John Amery pleaded guilty to high treason and was sentenced to death at opening session of his trial in London.
- 29. Constituent assembly proclaimed Yugoslavia a republic and abolished monarchy.
- 30. Labour-management conference closed without making any signal accomplishments. ¶ Alcide de Gasperi was named premier of Italy.

DECEMBER, 1945

- 1. Scores of German industrialists who aided Hitler's climb to power were arrested by British authorities in Ruhr area.
- 2. Nationalization of Bank of France and four other private banks was approved in French National Constituent assembly by vote of 521 to 35. ¶ Allied headquarters ordered Tokyo government to arrest 59 high-ranking Japanese on suspicion of being war criminals.
- 3. Pres. Truman asked congress to enact legislation similar to the Railway Labor act for solution of labour disputes; he also announced he would establish fact-finding boards to make recommendations for ending General Motors strike. ¶ State department said U.S. proposal for withdrawal of soviet, British and U.S. troops from Iran by Jan. 1 was rejected by soviet union.
- 4. Pres: Philip Murray of C.I.O. denounced Pres. Truman's proposal for new labour law and charged that Truman administration had yielded in "abject cowardice" to industry's refusal to "engage in collective bargaining."
- 5. Lt. Gen. Leonard T. Gerow told congressional Pearl Harbor inquiry board that he accepted responsibility for not demanding that Gen. Walter C. Short bolster defense measures at Pearl Harbor before Japanese attack. ¶ Destruction of Japan's cyclotrons by U.S. army was branded an "act of utter stupidity" by Dr. Karl T. Compton in letter to Sec'y of War Patterson. ¶ Cost of living increase from Jan. 1941 was formally set at 33% by Office of Stabilization Administration, which ruled that manufacturers could base request for higher prices to offset wage increases up to that level.
 - 6. Anglo-U.S. financial pact under which U.S. agreed

- to advance Great Britain \$4,400,000,000 to expedite early resumption of world trade was signed by Sec'y of State Byrnes, Sec'y of Treasury Vinson and Lord Halifax, British ambassador to U.S.
- 7. Gen. Marshall testified at Pearl Harbor inquiry that Gov. Dewey had complied with Marshall's request not to make public during 1944 presidential campaign knowledge that U.S. had broken Japanese secret code. ¶ State department disclosed that about 1,750,000 Germans in Czechoslovakia and up to 500,000 in Hungary would be moved to U.S. occupation zone in reich.
- 10. Japanese government was ordered by Allied head-quarters to abolish feudal system of land tenure. ¶ Judge Joseph C. Hutcheson of Texas was named chairman of six-man delegation to represent U.S. on Anglo-U.S. committee of inquiry on Palestine question. ¶ Allied bombings killed about 500,000 German civilians, injured 700,000 others and made 7,800,000 homeless, according to report by medical branch of U.S. Strategic Bombing survey.
- 11. Senate Foreign Relations committee dropped probe of charges by Maj. Gen. Hurley that career diplomats undermined his China policy.
- 12. Pres. Truman ignored opposition of organized labour and announced appointment of fact-finding board to recommend settlement of General Motors strike.
- 13. Agreement for joint withdrawal of troops from Syria and Lebanon and for mutual consultations on all middle eastern questions was basic feature of Anglo-French pact signed in Paris. ¶ British-U.S. loan agreement was approved in commons by 345 to 98 vote; Bretton Woods agreement was also endorsed 314 to 50. ¶ Dr. Karl Kobelt was elected president of Swiss federal council for 1946.
- 14. William D. Mitchell disclosed he and his staff would resign as counsels to congressional Pearl Harbor committee because prolonged examination of witnesses had held up "much pertinent evidence." ¶ Josef Kramer, Irma Grese and nine others convicted for crimes committed at Belsen and Oswiecim concentration camps were hanged in Hameln.
- 15. Permanent site for United Nations organization in United States was voted by U.N.'s preparatory commission by 30 to 14. ¶ Directive ordering end of Shinto as state religion of Japan was issued by Gen. MacArthur.
- 16. Sinclair Oil corporation ended long wage dispute by granting 18% pay increase and 40-hr. week to Oil Workers International union.
- 17. U.S. supreme court granted stay of execution to Gen. Tomoyuki Yamashita in order to examine petitions submitted by Yamashita's counsels for review of his trial.
- 18. Ford Motor company's offer of pay increase of 15 cents an hour was rejected by United Automobile Workers (C.I.O.). ¶ House of lords criticized "harsh" terms of U.S. loan to Britain, but ratified British-U.S. loan accord 90 to 8; about 100 conservative peers abstained from voting and some 600 others were absent.
- 19. Pres. Truman nominated Eleanor Roosevelt, Edward R. Stettinius, Jr., and Senators Tom Connally and Arthur H. Vandenberg as U.S. delegates to United Nations organization; Stettinius was designated chief delegate. ¶ Congress was asked by Pres. Truman to combine army and navy into single department of national defense under single cabinet officer. ¶ Pres. Truman's request that Second War Powers act be continued to 1947 was rejected by 31 to 30 vote in senate, which instead limited act to June 30, 1946. ¶ Capt. Charles B. McVay III was acquitted by navy courtmartial on charge of neglecting to give prompt "abandon



The rapid demobilization of U.S. servicemen after V-E day and V-J day found railroads unable to provide sleeping accommodations for all veterans travelling to separation centres and their homes

ship" orders when cruiser "Indianapolis" was struck by Japanese torpedoes.

20. Pres. Truman authorized fact-finding boards to examine company books in wage disputes, ruling that "ability to pay" was always relevant to issue of wage increases. ¶ OPA ordered end of tire rationing as of Jan. 1, 1946. ¶ Letters from two soviet scientists demanding that Turkey cede 180-mi. stretch of Black sea coast to soviet union were published in leading Russian newspapers. ¶ Dr. Karl Renner was elected president of 2nd Austrian republic.

22. U.S. and Britain announced recognition of Yugoslav government of Marshal Josip Broz (Tito). ¶ Pres. Truman ordered that European refugees and displaced persons be permitted entry into U.S. up to limit permitted by immigration laws.

23. Pope Pius XII designated 32 prelates from 19 countries for elevation to rank of cardinal. ¶ Pres. Truman vetoed bill calling for cancellation of \$51,000,000,000, in war appropriations and contracts because he disapproved rider that would shift U.S. Employment service to state governments within 100 days.

24. Sec'y Byrnes, Foreign Sec'y Bevin and Foreign Commissar Molotov agreed at Moscow conference to resume drafting of peace treaties with Italy, Rumania, Bulgaria, Hungary and Finland.

25. French finance ministry announced franc would be devalued to rate of 119.107 to dollar and 480 to pound.

27. Agreement on the control of atomic energy, formula for drafting of European peace pacts, participation of soviet union in rule of Japan, creation of Big Four trusteeship for five-year rule of Korea, withdrawal of U.S. and

soviet troops from China and measures to democratize Rumanian and Bulgarian governments were reached at Moscow conference by Sec'y of State Byrnes, Foreign Commissar Molotov and Foreign Sec'y Bevin. § Bretton Woods accord, franc devaluation and agreement for purchase credit with U.S. Export-Import bank were approved by French Constituent assembly. § International Monetary fund and Bank for Reconstruction and Development were formally established after representatives of 28 nations ratified Bretton Woods documents at Washington.

28. General Motors representatives quit Pres. Truman's fact-finding board declaring they were unable to cooperate as long as "ability to pay" was issue for investigation. § 1,500 persons were arrested in Palestine by British authorities following terrorist outbreak, climaxed by bombing of police station in Jerusalem.

29. Hitler's private will, dated April 29, 1945, discovered by U.S. intelligence officers, said fuehrer married Eva Braun, his mistress, and then said both would commit suicide to escape "disgrace" of surrender.

31. Sec'y of State Byrnes said Gen. MacArthur's authority as supreme Allied commander would be preserved under four-power Allied control plan for Japan. ¶ National War Labor board was terminated by Pres. Truman and supplanted by National Wage Stabilization board.

JANUARY, 1946

- 1. Siamese-British peace treaty was signed in Singapore, ending state of war which existed from Jan. 25, 1942.
- 3. William Joyce ("Lord Haw Haw"), convicted of treason, was hanged in London.
- **4.** U.S. war department announced it would slow demobilization of overseas troops because occupation armies were under strength.
 - 5. U.S. and Siam resumed diplomatic relations.
- 7. See'y of State Byrnes assured U.S. that "secrets" of atomic bomb would not be divulged prematurely. ¶ Rumanian cabinet, reorganized in line with Moscow conference declarations, was broadened to include two ministers of opposition parties. ¶ Estimated 20,000 U.S. soldiers held rally in Manila to protest demobilization slowdown.
- 9. King George VI, in welcoming address to United Nations delegates, urged them to place "service to whole community of nations" above national interests.
- 10. Paul-Henri Spaak of Belgium was elected president of general assembly of United Nations. ¶ Chinese Communists and Nationalists agreed to formal truce in undeclared civil war. ¶ Radar contact with moon was established by U.S. army signal corps; signal sent to moon from laboratory in Belmar, N.J., echoed back to sending station in 2.4 sec.
- 11. Coup staged by Haitian militarists resulted in ouster of President Elie Lescot. ¶ Albania was proclaimed republic by constituent assembly. ¶ Rear Adm. Earl W. Mills was named by Pres. Truman as chairman of U.S. maritime commission, succeeding Vice-Adm. Emory S. Land.

12. Brazil, Poland and Australia elected to U.N. security council for two-year terms and Mexico, Egypt and the Netherlands for one-year terms. ¶ Palestinian terrorists staged train robbery near Haifa and fled with railway pay roll estimated at £35,000.

15. Allegation that U.S. navy department withheld intercepted information foreshadowing Japanese attack on Pearl Harbor was made by Rear Adm. Husband E. Kimmel in testimony before congressional Pearl Harbor investigating committee. ¶ U.S. would insist on being sole trustee of Japanese islands in Pacific captured by U.S. forces, Pres. Truman declared.

- 16. Three-day nation-wide lock-out staged by Argentine businessmen and shopkeepers in protest against government's economic and social policies ended, but government refused to alter its stand.
- 17. Dr. Ba Maw, Burmese prime minister during Japanese occupation, voluntarily surrendered to British officers at Allied headquarters in Tokyo. ¶ U.N. general assembly was told by British Foreign Sec'y Bevin that Britain would place mandated territories of Tanganyika, Cameroons and Togoland under U.N. authority and establish Trans-Jordan as independent state. ¶ U.S. embassy in Buenos Aires revealed photostatic copies of documents suggesting that several Argentine newspapers were subsidized by German propaganda office during World War II. ¶ Demonstrations by U.S. soldiers against slowdown of demobilization were banned by Gen. Eisenhower, U.S. army chief of staff.
- 19. Pope Pius XII charged Russians were interfering with activities of Catholic Church in Ruthenia. § Iran formally accused soviet union of meddling in Iran's internal affairs and asked U.N.'s security council to investigate dispute.
- 20. Gen. Charles de Gaulle resigned as president of French provisional government.
- 21. Pres. Truman, in state of union and budget messages, warned that "national disaster" would result if congress failed to extend legislative safeguards against inflation; he also recommended statehood for Hawaii and Alaska; in budget statement, he estimated expenditures at \$35,860,000,000 with receipts at \$31,513,000,000. ¶ Nationwide shutdown of steel industry started as estimated 750,000 workers walked off jobs. ¶ Ebrahim Hakimi resigned as premier of Iran. ¶ Accusations that Britain was interfering in Greece and Indonesia were made by Andrei Gromyko, Soviet delegate, who asked U.N. security council to investigate. ¶ Greek government proclaimed martial law in Peloponnesus after right-wing monarchist group slew 14 hostages.
- 22. Gen. Walter C. Short charged before congressional Pearl Harbor investigating committee that U.S. war department had made him "scapegoat" for disaster. ¶ Premier Sutan Sjahrir declared he was opposed to British withdrawal of troops from Indonesia as suggested by soviet delegate to U.N.; Premier Themistocles Sophoulis of Greece said British military forces were in Greece with "full consent of Greek government."
- 23. British Foreign Sec'y Bevin condemned what he termed "political murders" in Poland and expressed disapproval of Franco regime in Spain. ¶ Felix Gouin was elected by French constituent assembly as president of provisional government.
- 24. Bikini atoll in Marshall Islands was selected as site for testing effect of atomic bombs on warships. ¶ Plan to establish commission to study control of atomic energy was adopted unanimously by U.N. security council.
- 25. Executive council of A.F. of L. unanimously voted to readmit United Mine Workers of America and John L. Lewis, U.M.W.A. president.
- 26. Ford Motor Co. and Chrysler Corp. negotiated wage agreements with United Automobile Workers (C.I.O.); United Packinghouse Workers (C.I.O.) voted to resume work under government operation. ¶ Ahmad Ghavam Saltaneh was named premier of Iran by 52-51 vote in Iranian parliament.
- 28. U.S. army's policy on demobilization and occupation was defended by Sec'y of War Patterson, who asserted demobilization program equalled rate of discharge of any nation in world. ¶ Iran told U.N. security council that

soviet union had destroyed Tehran government's authority by retaining troops on Iran's soil. ¶ William Benton, ass't sec'y of state, protested decision of Associated Press and United Press to withdraw their news services from state department. ¶ 60-day state of siege was proclaimed by Chilean government after union riots in Santiago.

- 29. Lt. Gen. Sir Frederick E. Morgan was cleared of charges of anti-Semitism and restored as chief of U.N.R.R.A. operations in Germany. ¶ President Felix Gouin of provisional government of France received 514 to 51 vote of confidence from constituent assembly. ¶ Sec'y of State Byrnes confirmed that Roosevelt and Churchill had agreed at Yalta conference to return southern half of Sakhalin Island and Kuriles to soviet union after war.
- 30. Resumption of Jewish immigration to Palestine at rate of 1,500 persons monthly was announced by British government. ¶ U.N. security council agreed to permit soviet union and Iran to settle dispute over Azerbaijan by direct negotiation, but insisted on right to pass judgment on final agreements.
- 31. Sec'y of State Byrnes asserted that reports from Poland indicated security police were committing political murders. ¶ Maj. Gen. Eurico Gaspar Dutra was sworn in as president of Brazil. ¶ Plans for establishing coalition government for China were unanimously approved by political consultation conference in Chungking.

FEBRUARY, 1946

- 1. Andrei Vishinsky told U.N. security council that presence of British troops in Greece was threat to peace and urged their immediate withdrawal; Foreign Sec'y Bevin of Britain labelled charge as "preposterous" and said Moscow propaganda was greater threat to peace. ¶ Discovery of new "dark" star in universe was reported at 74th meeting of American Astronomical society at Columbia university. ¶ Sec'y of Interior Ickes asserted before Senate Naval Affairs committee that Edwin W. Pauley had told him he could raise large sums for campaign contributions if government halted efforts to secure title to tidelands oil. ¶ Hungary was proclaimed republic and Premier Zoltan Tildy was elected president by new Hungarian national assembly.
- 4. Gen. Tomoyuki Yamashita's appeal against death sentence, pronounced by U.S. military tribunal in Manila, was rejected by U.S. supreme court, 6 to 2.
 - 5. Rumanian government was recognized by U.S.
- 6. British and soviet delegates in U.N. security council reached compromise when Andrei Vishinsky, soviet delegate, agreed not to press charge on alleged British interference in Greece and British Foreign Sec'y Bevin agreed to withdraw demand that council absolve Britain of Russian charges. ¶ Pres. Truman warned that U.S., to prevent "mass starvation" in liberated European countries, faced prospect of getting along with less spirits, less pastry and less white bread. ¶ Fifteen of world's leading jurists were selected for International Court of Justice in balloting by members of U.N. general assembly and security council; Judge Green H. Hackworth was designated U.S. representative.
- 9. Premier Stalin announced new five-year plan with huge production boosts, predicted soviet scientists would not only catch up but surpass scientists abroad and set new goals for production of oil, coal, steel and pig iron. ¶ Panamá's resolution condemning Franco regime in Spain and barring its representation in United Nations was adopted by 45 to o vote in U.N. general assembly.

- 10. Strike of Western Union employees in New York city ended. ¶ Netherlands' offer to establish Indonesian commonwealth with pledge that Indonesians would obtain right of self-determination was disclosed in Batavia by Hubertus J. Van Mook, acting governor general.
- 11. Transit strike of nearly 10,000 employees paralyzed transportation in Philadelphia. ¶ Agreement for full and free development of world air transportation was signed by U.S. and Britain after four weeks of negotiation at Hamilton, Bermuda. ¶ Proposal to place U.N. permanent headquarters in general region of Westchester county, N.Y., and neighbouring Fairfield county, Conn., was voted 22 to 17 by U.N.'s headquarters committee. ¶ Publication of secret agreement made at Yalta revealed that Stalin asked and received concrete economic and territorial concessions as price of soviet union's entry into war against Japan. ¶ U.S. supreme court rejected Gen. Masaharu Homma's plea for intercession against decision of military commission that sentenced him to death for committing atrocities in Philippines.
- 12. Soviet proposal which would compel displaced persons to be returned to their native lands was defeated in U.N. general assembly; Mrs. Roosevelt led opposition to soviet measure. ¶ Blue Book issued by state department charged Argentine government gave active support to German war effort during war and continued to grant haven to nazis. ¶ British authorities proclaimed martial law in Calcutta in effort to quell rioting in which 14 persons were killed and 170 injured.
- 13. Soviet request for U.N. probe of Indonesian situation was rejected by U.N. security council. ¶ Harold L. Ickes resigned as secretary of interior after dispute with Pres. Truman over nomination of Edwin W. Pauley as undersec'y of navy; Ickes asserted he refused to remain in administration where he was "expected to commit perjury for sake of party." ¶ Earl Browder was expelled from U.S. Communist party for having "betrayed" Marxist-Leninist principles and for "deserting" to side of "American monopoly capitalism."
- 14. Pres. Truman announced new wage-price formula, permitting limited wage and price increases; to implement new policy Truman named Chester Bowles as director of Office of Economic Stabilization and Paul A. Porter as OPA administrator. ¶ Tugboat strike that crippled harbour activities and paralyzed normal business life in New York city for eight days was ended. ¶ U.N. general assembly adjourned its first session. ¶ W. Averell Harriman's resignation as U.S. ambassador to soviet union and his replacement by Lt. Gen. Walter Bedell Smith was announced by Pres. Truman.
- 15. At least 22 persons allegedly engaged in espionage harmful to Canada's security were arrested by Royal Canadian Mounted Police.
- 16. London session of U.N. security council ended on note of discord as soviet union vetoed Anglo-French agreement to withdraw their troops from Levant states.
- 17. Steel strike was ended when United Steel Workers (C.I.O.) and U.S. Steel corporation reached wage agreement; steel firm agreed to pay increase of 18½ cents hourly; in return steel firms were permitted to increase steel prices \$5 a ton. ¶ New Egyptian cabinet was formed by Ismail Sidky Pasha.
- 18. Thirty-two new cardinals were created by Pope Pius XII at secret consistory in Vatican City. ¶ Belgian elections resulted in political stalemate with majority won by left-wing coalition in chamber of deputies neutralized by

Christian Socialist majority in senate.

- 20. Soviet union admitted receiving data on atomic energy and radio location from Canada, but said information could have been found in Smyth report and charged it was "ridiculous" to assert that revelation of such information would threaten Canada's security. ¶ Pope Pius XII denounced "modern imperialism" as political philosophy that carried within it "germs which endanger very foundations of human existence"; pontiff also affirmed "supranational character of church and its world-wide unity."
- 21. Clashes between British troops and anti-British demonstrators in Cairo resulted in estimated 12 dead and scores injured. ¶ Police building in Tel Aviv was rocked by explosion as Palestinian terrorists renewed raids on police headquarters in both Tel Aviv and Haifa. ¶ Former Premier Risto Ryti and seven other former cabinet members were found guilty by special "people's court" of leading Finland to war against U.S.S.R.; Ryti was sentenced to ten years of hard labour.
- 23. Gen. Tomoyuki Yamashita, convicted as war criminal, was hanged near Los Banos, Luzon. ¶ Week-long strike of sailors aboard royal Indian navy ships ended with surrender of mutineers. ¶ U.S. navy high command confirmed verdict of court martial finding Capt. Charles B. McVay III guilty of negligence in loss of cruiser "Indianapolis," but remitted his sentence.
- 25. Formal agreement on military reorganization of China's armies was signed by Chungking and Chinese communist representatives and Gen. G. C. Marshall, U.S. mediator. ¶ Week-long rioting between Indians and British troops caused deaths of 228 persons and injuries to 1,047 others. ¶ Supreme court ruled 6 to 2 that U.S. military courts established under martial law in Hawaii lacked authority to try civilians.
- 26. Julius A. Krug was named secretary of interior by Pres. Truman.
- 28. Agreement providing for withdrawal of Chinese troops from Indo-China and ending of French extraterritorial rights in China was signed by French and Chinese governments. ¶ France endorsed U.S. proposal for Anglo-French-U.S. declaration on Spain and closed its Spanish frontier.

MARCH, 1946

- 2. Citizens of Greenwich, Conn., voted 5,505 to 2,019 to oppose establishment of permanent U.N. headquarters in their community.
- 4. U.S., Britain and France, in joint statement, called on Spanish people to oust Gen. Franco by peaceful means. ¶ Field Marshal Mannerheim's resignation as president of Finland was announced by Premier Paasikivi.
- 5. Winston Churchill, in speech at Fulton, Mo., advocated Anglo-American "fraternal association" to halt "expansive and proselytizing tendencies" of soviet union.
- 6. Draft of new Japanese constitution included clauses renouncing war "forever," prohibiting maintenance of armed forces, limiting emperor's powers and granting full civil rights.
- 7. Sec'y of State Byrnes accused soviet union of violating pledge to withdraw troops from Iran by March 2 deadline and called on Russia to evacuate completely all troops there.
- 9. Premier Juho K. Paasikivi was elected president of Finland by parliament.
- 11. Sec'y of State Byrnes challenged soviet assertion that U.S. had violated Moscow agreement in urging broadening of Bulgarian cabinet and expressed surprise that U.S.S.R. objected to "so fundamental and simple a proposition."

13. Winston Churchill was denounced as warmonger by Stalin, who said Churchill's speech at Fulton, Mo., was a "dangerous act" designed to sow discord among wartime allies. J Gen. Draja Mikhailovitch, Chetnik leader, was captured in mountain hide-out by Yugoslav forces. ¶ Hermann Goering admitted at Nuernberg trial that he did everything in his power to strengthen nazi movement and assure Hitler of his place as chancellor. ¶ Pres. Truman withdrew nomination of Edwin W. Pauley as undersecretary of navy at latter's request, but said Pauley emerged from "vicious and unwarranted attacks with integrity unscathed . . . and with honour unsullied." ¶ General Motors Corp. strike ended on 113th day of walkout when G.M. agreed to pay wage increase of 181/2 cents hourly to United Automobile Workers (C.I.O.). ¶ General Electric strike was settled when company and United Electrical Radio and Machine Workers (C.I.O.) agreed on 181/2-centsan-hour pay increase.

15. Winston Churchill renewed appeal for "fraternal" Anglo-American co-operation but denied he had ever aimed at war alliance between two countries; he also expressed belief that soviet union did not want war. ¶ Fred Rose, member of parliament, was arrested by Canadian government on charge of acting as intermediary for soviet espionage ring. ¶ Prime Minister Attlee renewed offer of complete independence to India but specified Indians first must agree among themselves on future constitution before Britain would grant freedom.

16. Foreign Sec'y Bevin said his offer to extend Soviet-British alliance to 50 years was "seriously proposed and seriously meant." ¶ Gen. Marshall reported, on return to Washington, that situation in Manchuria was "extremely critical," with Chinese communists and Nationalists fighting for control of areas evacuated by soviet troops. ¶ Soviet authorities informed Denmark that Red army would evacuate Bornholm Island as soon as Denmark was in position to take it over. ¶ Announcement that U.S. would enter no alliance to maintain its security, either with Britain against soviet union or with soviet union against Britain, was made by Sec'y of State Byrnes, who added U.S. would seek "path to enduring peace" in United Nations.

17. Progressive party of Wisconsin voted by overwhelming majority to rejoin Republican party.

18. Bernard Baruch was appointed by Pres. Truman to become U.S. member of U.N. atomic energy commission.

19. Iran formally notified U.N. security council that it had a dispute with soviet union over question of presence of Russian troops on Iranian soil. ¶ Mikhail I. Kalinin retired as chairman of presidium of supreme soviet of soviet union and was succeeded by Nikolai M. Shvernik. ¶ Soviet union and Switzerland re-established diplomatic relations after 22-year break.

20. Soviet union asked for postponement of U.N. security council meeting to April 10 on grounds that negotiations were continuing with Iran over troop evacuation.

21. Fiorello H. La Guardia was named director general of U.N.R.R.A., succeeding Herbert H. Lehman.

22. Prime Minister Stalin affirmed confidence in U.N. as "serious instrument" for preserving peace, declared that no nations desired war but asserted some "political groups" were fostering discord throughout world. ¶ Pres. Truman announced that atomic bomb tests at Bikini atoll, scheduled for May 15, had been postponed six weeks.

23. W. Averell Harriman's appointment as U.S. ambassador to Britain, succeeding John G. Winant, was announced at White House; Winant was appointed U.S. representative to U.N. economic and social council. ¶ Chi-

nese Foreign Minister Wang Shih-chieh disclosed soviet notification that withdrawal of Red army forces from Manchuria would be completed by end of April.

24. Soviet union announced its troops were evacuating Iran and that withdrawal would be complete in six weeks.

25. U.N. security council, holding first session in U.S., heard Pres. Truman pledge full U.S. support and Sec'y of State Byrnes declare no nation had right to treat questions affecting world peace as "questions of honour which cannot be discussed."

26. Lt. Nicolai G. Redin, soviet officer, was arrested in Portland, Ore., by F.B.I. on espionage charges.

27. Andrei Gromyko, soviet delegate, walked out of U.N. security council session after delegates rejected by 9 to 2 vote soviet proposal to postpone discussion of Iranian case to April 10. ¶ Walter Reuther was elected president of United Automobile Workers (C.I.O.), defeating R. J. Thomas (incumbent) by narrow margin.

28. Col. Juan D. Perón won sufficient electoral votes in Argentine elections to assure him presidency.

30. Some 800 Germans were arrested in U.S. and British zones of Austria and Germany in raid designed to crush attempt of some nazis to revive party.

APRIL, 1946

- 1. Estimated 400,000 soft coal miners of U.M.W. (A.F. of L.) went on strike after operators and union delegates failed to agree on latter's demands for health and welfare programs and wage increases. ¶ Disclosure that U.S. would give up all bases it had built in Cuba during war was made by Sec'y of State Byrnes. ¶ Rep. B. Carroll Reece of Tennessee was elected chairman of Republican national committee.
- 4. Soviet union's assurance to evacuate all its troops from Iran by May 6 was accepted by U.N. security council, which deferred discussion of dispute. ¶ Pope Pius XII said one-quarter of world faced famine and warned that unless adequate food was shipped to hunger areas, political disorders would arise.
- 5. "Complete agreement" on all Russo-Iranian questions and formation of Russo-Iranian oil company was announced in joint communiqué of Moscow and Tehran governments. ¶ U.S. request that U.S. officers be allowed to testify at trial of Gen. Draja Mikhailovitch was refused by Yugoslav government.
- 6. Pres. Truman warned intense Anglo-Soviet rivalry in near east could bring war and said U.S. military power would be used to back up United Nations in defending sovereignty of that area from threats of coercion and penetration. ¶ Andrei Gromyko, soviet delegate, requested U.N. security council to remove Iranian dispute from its agenda.
- 8. State department announced U.S. was prepared to join Argentina in hemispheric defense treaty provided latter's government carried out pledges to eliminate "axis influences." ¶ Congress was warned by Gen. Eisenhower that failure to extend selective service after May 15 deadline would represent gamble with nation's safety and world peace.
- 9. Hugh Dalton, chancellor of exchequer, presented budget which he said was drawn on assumption Britain would get loan from U.S. ¶ George S. Messersmith was named U.S. ambassador to Argentina and William D. Pawley ambassador to Brazil.
- 10. Andrei Gromyko was released from duties as soviet ambassador to U.S. to devote all his time to post as dele-

766 gate to U.N. security council; Nikolai V. Novikov succeeded Gromyko as ambassador. ¶ Oscar Lange, Polish delegate, formally filed charges before U.N. security council that Franco Spain was endangering world peace. ¶ Marshal Georgi K. Zhukov's replacement by Gen. Vassily D. Sokolovsky as soviet member of Allied control council in Berlin was announced in Moscow.

> 12. Pres. Truman, in ceremony commemorating first anniversary of Franklin D. Roosevelt's death, pledged self to govern "not for benefit of privileged few but for welfare of all the people." § Japan's two principal conservative parties-Liberal and Progressive parties-won control of diet in first general election after end of World War II. ¶ Viscount Alexander of Tunis was sworn in as governor general of Canada.

> 14. Gen. Chou En-lai, military leader of Chinese communists, asserted his party did not recognize Chinese National government's right to drive Chinese communists out of Manchurian areas evacuated by soviet forces. ¶ German Social Democrats in U.S., French and British zones of Berlin joined German communists to form new party.

> 17. Poland asked U.N. security council to have all member states break diplomatic relations with Franco Spain.

> 18. League of Nations was voted out of existence by delegates of 34 nations at final meeting of body in Geneva. ¶ Marshal Tito's government in Yugoslavia was accorded full diplomatic recognition by U.S. ¶ Predominantly royalist government in Greece was formed by Constantin Tsaldaris, new premier.

> 20. Pope Pius XII exhorted Catholic Action youth delegates in Italy to battle "anti-Christian" forces in politics in what was interpreted as plea to Italian Catholics to vote against communists in national elections. ¶ Chinese National government spokesman acknowledged fall of Changchun to Chinese communists.

> 22. Senator Vandenberg urged senate to approve proposed credit of \$3,750,000,000 to Britain. ¶ Owen J. Roberts, former supreme court justice, belittled U.N. as instrument of peace and urged U.S. to take lead in calling international parley for establishment of world government to outlaw war and curb armaments.

> 23. Rejection of plea to remove Iranian dispute from agenda in U.N. security council led soviet delegate, Andrei Gromyko, to announce that Russian delegation would refuse to participate in any future talks on Iranian controversy. ¶ Body of Benito Mussolini was stolen from unmarked pauper's grave.

> 24. U.S. state department disclosed that it had concluded agreement to grant \$90,000,000 credit to Poland provided elections in that country were "free and unfettered." ¶ More rigid discipline among U.S. troops in Europe was ordered by Gen. Joseph T. McNarney.

> 25. Conference of foreign ministers of U.S., soviet union, Great Britain and France opened in Paris.

> 27. Manuel A. Roxas, president-elect of Philippines, said he proposed policy of co-operation with U.S. in far east and with United Nations. I Plan to limit future size of Italian fleet was agreed upon by foreign ministers of U.S., soviet union, Britain and France in their Paris conference.

> 28. Manchurian rail hub of Tsitsihar was reported captured by Chinese communist armies.

> 29. Sec'y of State Byrnes at meeting of foreign ministers in Paris proposed four-power treaty which would guarantee disarmament of Germany for 25-year period. ¶ Resolution expressing moral condemnation of Franco regime

in Spain was voted unanimously by ten members of U.N. security council, with soviet union abstaining. ¶ Gen. Hideki Tojo and 27 other members of Japanese militarist clique were formally indicted on 55 counts, by Allied court in Tokyo.

30. Prime Minister Stalin asserted soviet union would be true to policy of peace and security but stated "international reaction" was "hatching plans for new war." ¶ Recommendation that 100,000 Jews be permitted entry into Palestine as soon as possible was contained in report issued by Anglo-American Committee of Inquiry. ¶ Dr. Hjalmar Schacht told International Military Tribunal sitting at Nuernberg that Adolf Hitler had "deceived world, Germany and me."

MAY, 1946

1. Sec'y of State Byrnes proposed and Foreign Minister Molotov rejected cut of occupation armies of four powers in Austria to 15,000 men each, at foreign ministers conference in Paris. I Pres. Truman's bill for merging armed services was criticized by Sec'y of Navy Forrestal on ground it might open way for "ambitious" officer in post of supreme chief of staff to mould military "and possibly national policy to suit his ends." ¶ Hugh Dalton, chancellor of exchequer, was appointed by British cabinet as a governor of International Monetary fund and bank.

2. Emergency brown-outs were decreed in Illinois and northern Indiana in move to economize on fuel during coal strike.

3. War crimes trial of Gen. Hideki Tojo, former premier, and 25 other Japanese defendants before International Military court started in Tokyo. ¶ U.N. security council was formally notified by France and Britain that all their troops had been withdrawn from Syria 15 days ahead of schedule. ¶ Vice-Premier Edward Kardelj told Paris council of foreign ministers Yugoslavia would reject any solution of frontier dispute with Italy that would put Slavic minority under Italian rule. ¶ Sec'y of State Byrnes's proposal for four-power pact to rule Germany was criticized by Tass, official soviet news agency, as potential screen behind which U.S. could retreat from its Potsdam commitments. ¶ Reconstruction loan of 20,000,000,000 rubles, including rich lottery prizes, was floated by soviet government. J Ichiro Hatoyama, president of Japan's Liberal party, was banned from taking seat in imperial diet by order of Gen. MacArthur.

4. Revolt of convicts in Alcatraz federal prison was quelled with aid of U.S. marines after two-day battle; three convict ringleaders and two guards were killed and 14 other persons wounded. ¶ Soft coal strike was called "national disaster" in OWMR report which said effects of walkout would damage reconversion progress.

5. New French constitution sponsored by Socialist and Communist parties was rejected in referendum by more than 1,000,000 votes. J Mariano Ospina Pérez, Conservative party candidate, was elected president of Bolivia. ¶ Representatives of Hindu Congress party, Moslem league and British officials opened Simla parleys designed to find agreement on basic issue of unified India.

6. Program under which U.S. would arm, train, organize and equip armies of other western hemispheric states was outlined by Pres. Truman in message to congress. ¶ Pulitzer prize for best play of 1945-46 was awarded to State of the Union by Russel Crouse and Howard Lindsay. ¶ Hussein Ala, Iranian envoy to U.S., told U.N. security council soviet refusal to permit observers into Azerbaijan province prevented Iranian government from ascertaining whether all red army troops had evacuated the province.

7. British delegation in Cairo proposed evacuation of all British armed forces from Egypt in return for mutual aid alliance with Egyptian government to become operative in event of war. ¶ Cession of Transylvania to Rumania was unanimously approved by Big Four's council of foreign ministers at Paris. ¶ Winston Churchill urged western democracies to move together toward understanding with soviet union within framework of United Nations.

8. U.S.-Soviet conference in Seoul (Keijo) to establish interim government for Korea (Chosen) broke down.

9. Pres. Truman denounced walkout of coal miners as nearing status of strike against government. ¶ Victor Emmanuel III abdicated as king of Italy in favour of his son, Crown Prince Humbert.

10. Coal operators accepted two-week truce in soft coal strike offered by John L. Lewis, president of United Mine Workers. ¶ Soviet occupation authorities agreed to sharp reduction of their occupation costs and to provide U.N.R.R.A. with oil for its Austrian program. ¶ U.S. state department received sharp note from Arab league which demanded right to be consulted on future of Palestine. ¶ Huge 14-ton German V-2 rocket climbed almost 75 mi. in test of missile at White Sands proving grounds in New Mexico.

11. Pres. Truman in New York speech warned atomic bomb would remain "frightful weapon" to "destroy all of us" unless peoples of world learned to live together peacefully.

12. Simla parleys ended in failure when Hindu and Moslem parties were unable to reach common ground on plans for independent unified India. ¶ Young women of Italy were urged by Pope Pius XII to vote only for parties pledged to "respect rights of God and religion," in forthcoming Italian national elections.

13. Allied military government of Germany ordered destruction by Jan. 1 of all German military and nazi memorials and confiscation of all books glorifying naziism or militarism. ¶ Fifty-eight operators of Mauthausen concentration camp were convicted by U.S. military court in Dachau for torture and murder of thousands of imprisoned

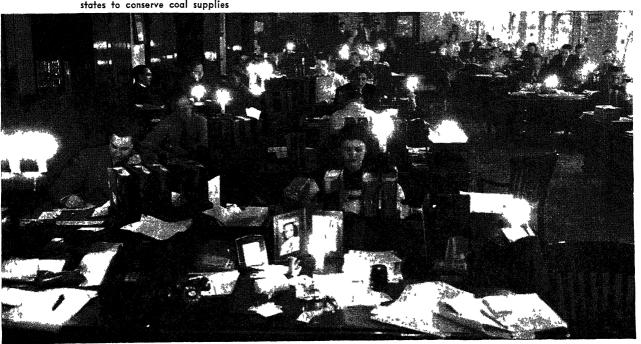
Office employees at Chicago, Ill., working by candlelight during the soft coal strike in May 1946. A dimout was imposed on 22 states to conserve coal supplies

victims, and were sentenced to die on gallows. ¶ Disclosure that atomic bombs which would be used in Bikini atoll tests were no more powerful than atomic missile dropped on Nagasaki, was made by Joint Army-Navy Task Force I. ¶ Demand for 7% levy on coal industry's annual \$1,000,000,000 pay roll for health and welfare fund was made by John L. Lewis, president of U.M.W. ¶ Gen. Ho Ying-chin resigned as chief of staff of China's Nationalist army.

14. Pres. Truman signed bill to extend selective service act to Sept. 1; this act banned induction of fathers and 18- and 19-year-old youths. ¶ Wheat program for 1946-47 issued by Sec'y of Agriculture Anderson requested continued food-saving measures throughout coming year. ¶ Warning that United Steelworkers of America (C.I.O.) would not tolerate interference by outside groups—"whether they be Communist, Socialist or any other group"—was issued by C.I.O. President Philip Murray.

15. Soviet delegate to Allied council for Japan was advised by George Atcheson, Jr., U.S. delegate, that U.S. does not favour communism "in United States or Japan." ¶ Continued disagreement on virtually all fundamental issues resulted in adjournment of Paris conference of foreign ministers to June 15. ¶ Gen. MacArthur was accused by Lt. Gen. Kuzma Derevyanko, soviet member of Allied control council, of failing to carry out Moscow conference terms by refusing to give council adequate notification on his directives. ¶ Joint letter drafted by Sen. David I. Walsh and Rep. Carl Vinson, chairmen of senate and house naval affairs committee, respectively, to Sec'y of Navy Forrestal said congress would not approve single department of common defense.

16. British white paper rejecting Moslem and Congress party plans for Indian government, set forth six-point plan as basis for constitution to be drafted by Indians, but rejected Moslem demand for Pakistan (separate state). ¶ Pres. Truman denounced draft measure as "bad legislation"; he also authorized induction into armed forces of childless men between 26 and 29 years. ¶ Pres. Truman's proposal that coal operators and miners submit their dis-



768 pute to arbitration was rejected by both parties. § Plans for extensive reorganization of government and recommendation for substantial enlargement of Federal Security agency and its eventual elevation to department status were given to congress by Pres. Truman. ¶ Foreign Minister Shigeru Yoshida succeeded Baron Kijuro Shidehara as Japan's premier; Yoshida retained foreign ministry portfolio. I Congressional action to outlaw strikes for at least six months was asked by Director John D. Small of Civilian Production administration.

> 17. Railways of U.S. were seized by Pres. Truman as emergency measure after railway unions refused to call off strike scheduled for May 18. J A.F. of L. pledged full support to its affiliate U.M.W. in labour dispute with coal operators. ¶ News dispatches from Washington suggested U.S. proposed that Canada join two-nation defense agreement for protection of North America, with special emphasis on Arctic frontiers. § Documentary evidence branding Franco Spain as cause of international friction and as constant threat to world peace was made public by special U.N. subcommittee. ¶ U.S. people were called on by Herbert Hoover to make great sacrifices to help save 800,000,000 people of world from "grimmest spectre of famine" in history. ¶ British cabinet mission's proposal for India union was approved by Mohandas K. Gandhi who said scheme was "seed to convert this land of sorrow into one without sorrow and suffering."

> 18. Railway unions postponed nation-wide strike for five days at behest of Pres. Truman.

> 19. Manila dispatches disclosed that Hukbalahap organization was conducting small-scale civil war against Philippine army's military police. ¶ Warning that Spain would not permit itself to be "Frenchified" and an appeal to people to throw out "foreign influences" were made by Gen. Franco in speech at Oviedo. I British foreign office confirmed reports that Gen. Wladyslaw Anders' Polish army in Italy would be sent to Britain for demobilization.

> 20. Declaration that U.S. would submit problem of world peace settlements to U.N. general assembly unless Big Four convoked peace conference in summer of 1946 was made by Sec'y of State Byrnes. ¶ Premier Ghavam es-Saltaneh of Iran admitted outbreak of fighting between Iranian government army and Azerbaijan forces. ¶ Proposal that new world food agency be established, that U.N.R.R.A. cease its work by Sept. 1 and that "normal" world trade in food and farming supplies be restored were made by Herbert Hoover.

> 21. Sec'y of Interior J. A. Krug was ordered by Pres. Truman to seize soft coal mines; Vice-Adm. Moreell was placed in charge of administering mines for government. J U.N. security council was officially notified by Hussein Ala, Iranian ambassador to U.S., that red army troops had evacuated all of Iran by May 6. J Sen. Vandenberg hailed what he termed positive, constructive and bipartisan U.S. foreign policy that emerged from Big Four meetings of foreign ministers in Paris. J 372 Danube river ships flying flags of many nations were seized by U.S. constabulary in U.S. zone of Germany.

> 22. Railway management and 18 of 20 railroad unions accepted Pres. Truman's suggested compromise of 181/2 cents increase per hour in wages; leaders of trainmen and engineers unions rejected proposal. § Soviet Iranian controversy was kept on agenda of U.N. security council after majority announced they were not satisfied as to whether Red army evacuation of Iran had been completed.

23. Nation-wide railroad strike began after heads of trainmen and engineers unions rejected Pres. Truman's request they remain on job until arbitration settled differences. ¶ Earl Browder, former U.S. communist leader, told correspondents in Moscow that his visit to Russia was to discuss publishing venture and that it had no political connotations.

24. Iran was notified by soviet ambassador at Tehran that Red army had completed its evacuation of nation by May 9. 9 Pres. Truman threatened to call out army if railroad strikers did not return to jobs by 4 P.M. E.S.T.,

May 25.

25. Pres. Truman appeared before joint session of congress and asked for temporary emergency powers to break strikes against federal government in any specified industry; he also requested authority to draft strikers into armed services and urged congress to formulate long-range labour policy designed to cut down work stoppages; acting on president's speech, house of representatives passed requested strike curbs by vote of 306 to 13; senate sidetracked measure which met strong opposition from both labour and conservative elements. ¶ Forty-eight hour national railroad strike was settled, with unions accepting Pres. Truman's proposed wage increase of 181/2 cents an hour. ¶ Addressing first session of U.N. economic and social council in U.S., Pres. Truman said its task was to achieve "freedom from want . . . to assure higher standards of living . . . and to promote fuller recognition of dignity and worth of human person." ¶ Emir Abdullah became King Abdullah Ibn-Hussein of Trans-Jordan in ceremonies at Amman, capital of new middle east kingdom.

26. Left-wing parties emerged victorious in Czechoslovak general elections, with communists receiving twice as many votes as any other single party. § A. F. Whitney, president of Brotherhood of Railroad Trainmen, denounced Pres. Truman as "political accident" and said his union had authorized him to spend \$2,500,000 to defeat every member of congress who voted for president's restrictive labour legislation.

27. Blunt charges that Anglo-U.S. "bloc" was waging offensive at Paris conference of foreign ministers against soviet union were made by Soviet Foreign Minister Molotov. ¶ U.S. bakers were ordered by department of agriculture to reduce size of bread loaves and rolls by 10% on

28. Agreement whereby U.S. would grant France credits totalling about \$1,400,000,000 was signed in Washington by Sec'y of State Byrnes and Léon Blum, special French emissary. ¶ Gen. Eisenhower and Adm. Nimitz urged congress to pass legislation permitting close military and economic collaboration among western hemisphere nations. ¶ Siam's appeal to U.N. for assistance in halting French invasion and occupation of strip of Siamese territory on Indo-China frontier was made public by U.N. security council. ¶ Sec'y of State Byrnes denied Soviet Foreign Minister Molotov's assertion that there was any Anglo-U.S. bloc and declared that U.S. invited British and soviet co-operation.

29. Francis J. Case strike control bill was approved by house of representatives by vote of 230 to 106 and sent to Pres. Truman for signature. I Forty-five-day coal strike ended when John L. Lewis signed contract with U.S. government under which U.M.W. was granted 181/2 cents hourly wage increase and establishment of welfare and retirement fund financed by operators by payment of 5 cents per ton. ¶ Hussein Ala, Iranian ambassador to Washington, was ordered by his government to refrain from making statements before U.N. security council on SovietIran dispute. ¶ Andrei Gromyko, soviet delegate to U.N. security council, said tendency of certain nations to play dominating part in U.N. was detrimental to "cause of peace and security." ¶ House foreign affairs committee was told by Sec'y of State Byrnes that U.S. foreign policy would be directed toward reduction of world armaments to level consonant with maintenance of internal order and external peace and security.

30. Georgia's legal department was ordered by Gov. Ellis Arnall to take action to revoke state charter of Ku-Klux Klan. ¶ Appeal to both Chinese communists and nationalists to lay down arms was issued by Gen. Marshall, special U.S. emissary, who warned China was on verge of "even greater calamity than World War II." ¶ Leaders of seven Arab League states announced their unanimous rejection of further Jewish immigration to Palestine.

31. Disclosure that Premier Stalin had rejected on grounds of ill health two presidential invitations to visit U.S., was made by Pres. Truman. ¶ U.S. and Britain sent parallel notes to Rumania asking government to promulgate new electoral law, set date for elections and assure fair and free vote.

JUNE, 1946

- I. Sen. Brien McMahon's bill for national civilian control of atomic energy was passed by senate in voice vote. ¶ Pope Pius XII, on eve of French and Italian general elections, appealed for voting against "state absolutism" and "wreckers of Christian civilization." ¶ U.N. subcommittee, declaring that Franco regime was potential menace to world peace, proposed that U.N. general assembly direct collective break in diplomatic relations with Spain unless Franco government was withdrawn and Spanish people freed by September. ¶ French foreign office asked U.S. and Britain to advise Siam that its government had not returned territories acquired from Laos and Cambodia in 1941. ¶ Gen. Ion Antonescu, former dictator, and three other Rumanian officials convicted as war criminals by Rumanian People's court, were executed.
- 2. Popular Republican party won majority of seats in French elections for new constituent assembly, with Communist and Socialist parties second and third respectively. § Gen. Eisenhower branded as "vicious" talk as to where, how and why next war would be fought. § Pres. Truman was urged by Philip Murray, C.I.O. president, to veto Case labour disputes bill on ground measure was dangerous to public welfare as well as to labour. ¶ Harry Bridges, president of I.L.W.U. and Joseph Curran, president of N.M.U., appealed to dock workers throughout world to support C.I.O. maritime unions if they went on strike. ¶ Statement attributed to Allied source in Nuernberg said soviet union already had demobilized more than 10,000,000 men from its armed services and planned to reduce current army of 6,000,000 to 4,500,000.
- 2-3. Majority of Italians voted for republic to replace monarchy in nation-wide referendum; official figures were 12,182,855 votes for republic and 10,362,709 votes for monarchy.
- 3. U.S. Chamber of Commerce asked Pres. Truman to approve Case labour disputes bill. ¶ Supreme court unanimously overruled convictions for contempt of court obtained against Miami newspaper for having criticized Florida judicial procedures. ¶ Pres. Truman told Nikolai V. Novikov, new soviet ambassador to U.S., that he would be happy if U.S.S.R. would give U.S. proposals same "sympathetic consideration" that U.S. would give soviet suggestions. ¶ Resignation of Edward R. Stettinius, Jr., as U.S. delegate to security council accepted by Pres. Truman.

- 4. Juan Domingo Perón was installed as 29th president of Argentina. ¶ Ernest Bevin, British foreign secretary, charged that soviet union believed it would achieve security only when "every country in world is patterned on soviet model." ¶ Eugene Meyer, publisher, was elected first president of International Bank for Reconstruction and Development.
- 5. Winston Churchill, in house of commons debate, supported Labour government's foreign policy and charged that seeds of World War III were being sown in Russian-occupied Europe. ¶ Spanish government, in communiqué to U.N. diplomats, challenged security council's authority and termed subcommittee's report condemning Franco regime "offensive." ¶ Sen. Warren R. Austin of Vermont was named U.S. representative on U.N. security council, succeeding Edward R. Stettinius, Jr. ¶ Pres. Truman was urged by Protestant delegation to recall Myron C. Taylor as his personal representative to Vatican on grounds that his mission there was "contrary to historic American principle of separation of church and state."
- 6. Fred M. Vinson was named by Pres. Truman as chief justice of U.S. supreme court; John W. Snyder was named secretary of treasury. ¶ Trygve Lie, secretary general of U.N. security council was given extraordinary powers to intervene in council debates. ¶ Argentina and soviet union resumed diplomatic relations after 28-year lapse.
- 7. Rumania answered U.S. state department note on voting with assertion nation was "eager" to hold elections and implied U.S. note was influenced by foreign propaganda. ¶ Widespread terrorism in Burma was laid to activities of "armed bandits" said Arthur Henderson, undersecretary of state for India.
- 8. Breakdown in Dutch-Indonesian negotiations was implied as President Achmed Soekarno of Indonesian republic broadcast appeal to his followers to mobilize against Dutch.
- 9. Gen. Eisenhower in speech at Northfield, Vt., urged complete support of U.N. but warned there was "obvious limit to our unilateral disarmament." ¶ Trygve Lie, U.N. secretary general, said in Detroit speech immediate task of U.N. was to forestall war; continuing task was to prevent "dangerous political conditions from ever arising."
- 10. Justice Robert H. Jackson at Nuernberg news conference attacked Justice Hugo Black for participating in decisions affecting former law partner and warned continuation of such practices would bring U.S. supreme court into disrepute. ¶ U.S. supreme court affirmed conviction of three leading U.S. tobacco companies for violation of antitrust act.
- 11. Case labour disputes bill was vetoed by Pres. Truman who charged measure struck only at symptoms, not underlying causes, of industrial strife and would not halt strikes; presidential veto was sustained when house of representatives failed to get necessary two-thirds majority to override it. ¶ Gen. Draja Mikhailovitch at his trial for treason in Belgrade court admitted he had contact with Germans and Yugoslav puppet government in 1941, but insisted he was trying to lure Quislings to join his forces.
- 12. British Labour party conference at Bournemouth gave overwhelming support to Foreign Secretary Ernest Bevin's foreign policy; Bevin asserted Russians rebuffed his earnest efforts at friendliness and implied rejection of Anglo-U.S. committee's Palestine report, stating that he would have to put another division in Holy Land to safeguard 100,000 Jewish immigrants.



13. King Humbert left Italy after reign of only 35 days; results of Italian elections, which favoured democracy over monarchy, forced his departure. ¶ U.N. subcommittee's compromise plan on Franco Spain was rejected and branded as cowardice by Andrei A. Gromyko, soviet delegate to security council. ¶ War department disclosed radioactive isotopes produced from atomic pile at Oak Ridge, Tenn., would be made available for medical and biological research.

14. U.S. atomic program outlined by Bernard M. Baruch, chief U.S. delegate, at first meeting of U.N. atomic energy commission, contained formal offer to surrender store of atomic bombs and to turn over all atomic secrets to world Atomic Development Authority under which no nation would have veto power. ¶ U.S., Britain and France accepted Soviet frontier with Rumania at Big Four meeting of foreign ministers in Paris. ¶ Pres. Truman said U.S. would have no official representative at Vatican after completion of peace treaties. ¶ Paul V. McNutt was designated first U.S. ambassador to new Philippine republic. ¶ Senate passed by voice vote legislation authorizing use of target fleet for atomic bomb experiment at Bikini atoll. ¶ Pres. Truman continued OWMR and appointed John R. Steelman as its director.

15. Twelve-point program for merging armed forces in single department of national defense was submitted to congress by Pres. Truman. ¶ Fred Rose, communist member of Canadian parliament, was convicted in Montreal court on charge of plotting to communicate wartime secrets to Moscow.

16. Viscount Wavell, viceroy of India, announced breakdown of negotiations for formation of Indian interim government and invited 14 representative Indian leaders to form new government on parity basis.

17. Sale of government's \$200,000,000 steel plant at Geneva, Utah, to U.S. Steel corp. for \$47,500,000 was approved by Attorney General Tom Clark. ¶ Joseph B.

The "Haviva Reik," bearing 470 illegal Jewish immigrants, is shown at Haifa where it was towed on June 8, 1946, after being intercepted by a British destroyer. The year was marked by anti-British violence committed by terrorist organizations protesting the ban on the entrance of Jewish refugees into Palestine

Keenan, chief U.S. prosecutor in Japanese war crimes trials, disclosed that decision had been made on "high political levels" not to try Emperor Hirohito as war criminal.

18. Broad program for improving medical care, pensions and rehabilitation of war veterans was authorized by Pres. Truman. ¶ Soviet union exercised veto to block U.N. security council's decision to refer question of Franco regime to general assembly.

19. Harold D. Smith resigned as U.S. budget director to become vice-president of International Bank of Reconstruction and Development. ¶ Soviet plan for atomic energy control was submitted by Andrei Gromyko, soviet representative on U.N. atomic energy commission; soviet proposal would outlaw atomic bombs by international agreement and permit all five major powers on security council to retain veto powers. J Egyptian communiqué disclosed that Haj Amin el Husseini, exiled grand mufti of Jerusalem, had fled to Egypt where it was reported he would receive asylum. I New and more rigorous disciplinary code for soviet armed forces designed to contribute to "still greater might of soviet state" was decreed by Premier Stalin. I New constituent assembly of France elected Georges Bidault president of provisional government. I Joe Louis knocked out Billy Conn in 8th round of scheduled 15-round bout for world's heavyweight boxing championship.

20. Peacetime U.S. army budget of \$7,091,034,700 for coming fiscal year was submitted to congress by subcommittee of House Appropriations committee.

21. Disclosure that U.S. had offered to share control over Japan with soviet union, Britain and China for 25-year period, after post-war occupation, to keep Japan

- permanently disarmed, was made by state department. ¶ Dr. Oscar Lange, Polish ambassador to U.S., said his country no longer was interested in proposed \$90,000,000 U.S. credit because it had received generous loan terms from soviet union.
- 23. India lodged complaint with United Nations general assembly that South Africa's discriminations against its 250,000 Indian residents would harm relations between two countries.
- 24. Polish proposal that U.N. members break diplomatic relations with Franco regime in Spain was rejected by 7 to 4 vote in U.N. security council. ¶ Viscount Wavell's proposals for interim government pending drafting of Indian constitution were rejected by Congress party. ¶ Gen. Mao Tse-tung's demand that U.S. cease all military aid to Chinese nationalist government and promptly withdraw its troops from China was disclosed in Nanking.

25. U.S. agreement to release more than \$600,000,000 in frozen funds to Argentina was disclosed by Foreign Minister Juan Bramuglia. ¶ Mongolian People's republic applied to United Nations for membership.

- 26. Soviet union invoked veto three times during debate in U.N. security council on Spanish issue; Sir Alexander Cadogan, British delegate, sharply criticized soviet use of veto power as "unjustified." ¶ Soviet Ministry of State Control announced widespread firings and finings of factory directors, engineers and accountants for illegal distribution and appropriation of bonuses and factory funds and for falsifying industrial output figures.
- 27. Dodecanese Islands were awarded to Greece and Tenda and Briga area of northwest Italy to France by Council of Foreign Ministers meeting in Paris. ¶ Canadian Finance Minister J. L. Ilsley announced Canada planned to meet nearly 90% of expenditures from revenue and to reduce personal and corporate income taxes. ¶ Gen. Eisenhower appealed to congress for additional 25,000 officers to meet army requirements. ¶ Britain announced that bread would be rationed on basis of nine oz. daily per adult as of July 21.
- 28. Chester A. Bowles resigned as director of Economic Stabilization and appealed to Pres. Truman to veto compromise legislation extending OPA, which he termed an attempt to "legalize inflation." ¶ Pres. Truman's plans for reorganization of federal government was rejected in house of representatives. ¶ Statement that 20,000 U.S. marines would remain in China to guard supply lines from coal mines to coastal cities was issued by Dean Acheson, acting secretary of state. ¶ Enrico de Nicola was elected provisional president of new Italian republic. ¶ Arturo Toscanini cancelled scheduled concert in Paris because he was "profoundly bitter" over Big Four's agreement to cede Tenda and Briga areas in northwest Italy to France.
- 29. Amended OPA bill was vetoed by Pres. Truman who declared measure presented choice "between inflation with a statute and inflation without one"; president in radio broadcast urged people to advise congressmen of their determination to retain price controls; house of representatives sustained presidential veto. ¶ Indonesian republic announced that Premier Sutan Sjahrir and five members of his cabinet had been kidnapped by armed band.
- 30. Fair Employment Practices committee expired after congress refused its extension. ¶ Superfortress dropped Nagasaki-type atomic bomb from height of 30,000 ft. over 73 vessels anchored in target area off Bikini atoll; 5 ships were sunk, 9 craft were heavily damaged and at least 45 other ships suffered varying degrees of damage as a result of explosion.

JULY, 1946

1. Tentative agreement on Yugoslavia's western frontier on basis of French compromise was reached by Big Four's foreign ministers in Paris. ¶ Charges that grave irregularities occurred in Polish national referendum were made by Stanislaw Mikolajczyk, Polish opposition leader.

2. U.N.R.R.A. halted shipment of tractors to White Russian and Ukrainian republics because soviet union allegedly was exporting tractors to Argentina. ¶ Premier Sutan Sjahrir of Indonesian republic asserted he was kidnapped by Javanese troops who mistook him for Dutch spy; on discovering error, they released him.

3. Hobbs bill aimed at curbing "racketeering" by labour unions was signed by Pres. Truman.

- 4. Philippine republic was born in ceremonies at Manila; sovereignty over islands was transferred by U.S. to Filipino people; recognition of independence of Philippine republic was proclaimed by Pres. Truman. ¶ Big Four's foreign ministers agreed to hold 21-nation peace conference on July 29. ¶ At least 39 Jews and 4 Poles were killed in Kielce, in worst anti-Jewish pogrom in Poland since country's liberation.
- 5. Canadian government pegged its currency unit at parity with U.S. dollar to ease "inflationary pressures."
- 6. Austrian government was ordered by soviet occupation authorities to surrender all former German property in eastern Austria. ¶ Chairman May of house military affairs committee denied there was anything "out of line" in his relations during war with lumber company as alleged by senate war investigating committee. ¶ Jawaharlal Nehru was formally inducted as president of India's Congress party.
- 7. Deportation from Austria of all Germans of non-Austrian descent was ordered by soviet occupation authorities. ¶ Arab Higher committee accused Pres. Truman of "irresponsible" statements, urging him to admit Jews to U.S. if his sympathy for plight of Jews in Europe was genuine. ¶ Mother Cabrini, who died in Chicago in 1917, was canonized by Pope Pius XII.
- 8. Establishment of world atomic control agency that would license and inspect atomic energy activities without subjection to veto was proposed by Herbert V. Evatt, Australian delegate to U.N. atomic energy subcommittee.
- 9. Three hundred U.N.R.R.A. employees in Shanghai cabled Director LaGuardia to complain of Chinese government's "persistent misuse" of U.N.R.R.A. materials. § Foreign Minister Molotov urged drastic revision of Sec'y of State Byrnes' proposal for a four-power guaranty of Germany's disarmament and asked for \$10,000,000,000 in reparations from the reich. § Dr. J. Leighton Stuart was named by Pres. Truman as U.S. ambassador to China; Robert Butler was named U.S. ambassador to Australia.
- 10. French claims for separation of the Ruhr were flatly rejected by Foreign Minister Molotov, who also opposed federalization of reich. ¶ U.N. health assembly voted 35 to 4 to give extraordinary powers to World Health organization.
- 11. Sec'y of State Byrnes and Foreign Sec'y Bevin declared U.S. and Britain would organize their zones in Germany as single economic unit, unless Big Four reached accord for economic merger of all four German zones.
- 12. Italian Premier de Gasperi formed cabinet composed of representatives of Christian Democratic, Communist, Socialist and Republican parties.
 - 13. House of representatives approved loan of \$3,750,-

772 ooo,ooo to British by 219 to 155 vote and sent it to Pres. Truman for signature.

15. Bill approving loan to Britain was signed by Pres. Truman. ¶ Gen. Draja Mikhailovitch was convicted of "treason" and "war crimes" by military tribunal and sentenced to hang in Belgrade. ¶ Majority report on Pearl Harbor inquiry commended diplomatic efforts of Pres. Roosevelt and Cordell Hull to avert war and placed blame for disaster on army and navy commands in Hawaii.

16. Pres. Truman ordered that only men between ages of 19 to 29 be called up in September draft. ¶ 43 German S.S. (Elite Guard) troops were convicted of slaying 900 U.S. prisoners and Belgian civilians during the 1944 Battle of the Bulge and were sentenced to die.

17. Gen. Draja Mikhailovitch and eight other Yugoslavs convicted of treason and collaboration with Germans were executed by firing squad. ¶ Nicolai Redin of soviet navy was cleared of espionage charges by federal court jury in Seattle. ¶ Mitsui family, one of Japan's most powerful financial and industrial oligarchies, voted its own dissolution.

18. Sen. Warren R. Austin of Vermont was named by Pres. Truman to represent U.S. at U.N. general assembly; others named by Truman to U.N. posts were Senators Connally and Vandenberg; Rep. Sol Bloom of N.Y. and Mrs. Eleanor Roosevelt. ¶ Rationing of bread in Britain was approved by 305 to 182 vote in house of commons.

19. Soviet delegate Gromyko told U.N. atomic energy commission's scientific and technical committee that U.S. S.R. agreed with U.S. intention not to reveal atomic secrets.

20. Pres. Roosevelt was found blameless for Pearl Harbor disaster by 8 to 2 vote of members of congressional Pearl Harbor investigating committee.

21. Revolt in Bolivia resulted in assassination of Pres. Gualberto Villarroel, whose body was hung from lamp post in La Paz public square.

22. Chairman May of house military affairs committee refused to appear before senate War Investigating committee probing his connection with several munitions firms that allegedly made excessive war profits; May said he was too busy. ¶ Nestor Guillen, head of Bolivia's supreme court, was installed as provisional president after ouster of old regime by student and worker revolutionaries. ¶ At least 120 persons were killed and others were missing in explosion that wrecked King David hotel in Jerusalem; Jewish terrorists were blamed for bomb blast.

23. Irgun Zvai Leumi, Jewish terrorist organization in Tel Aviv, acknowledged responsibility for bombing of King David hotel, but asserted "British tyrants" brought it upon themselves by ignoring phone warnings that hotel was to be bombed. § Bill authorizing U.S. to "stock-pile" strategic and critical materials was signed by Pres. Truman, who objected, however, to "Buy American" provisions of measure.

24. U.S. plan for establishment of semi-autonomous world atomic control agency was flatly rejected by Andrei Gromyko, soviet delegate to U.N. security council, who warned that attempt to undermine veto would be "dangerous and maybe fatal."

25. Revised OPA bill was "reluctantly" signed by Pres. Truman, who said it failed to assure maintenance of stable prices; proclamation re-establishing all rent controls as of June 30 was issued by OPA. ¶ Jesus T. Pinero was named governor of Puerto Rico by Pres. Truman. ¶ Explosion of underwater atomic bomb in second Bikini test sank ten

ships, including battleship "Arkansas" and carrier "Saratoga," and damaged six other craft.

26. OPA resumed functioning after 24-day lapse and issued scores of orders revising price ceilings on many commodities and items. ¶ Senate approved without opposition house-accepted measure to reorganize and streamline congress and sent bill to Pres. Truman for signature. ¶ Soviet union was accused by U.S. of stripping Hungary of vital food supplies and industrial materials in state department note delivered to Foreign Minister Molotov. ¶ U.S. Prosecutor Robert H. Jackson demanded conviction of 22 top nazis on trial at Nuernberg as war criminals, charging they were just as guilty as Hitler because they put "loaded gun in his eager hands."

27. Pres. Truman declared U.S. supported Sec'y Byrnes in his efforts to get "just peace for world," as secretary of state departed for Paris peace parley. ¶ Chinese Communist proposal for unconditional cessation of Chinese civil war was rejected by Nanking government. ¶ Threeman decontrol board to have final authority in determining what items and commodities were to stay under OPA price control was named by Pres. Truman; members were Roy L. Thompson (chairman), Daniel W. Bell and George H. Mead.

28. Proposal that France and Britain join in alliance to offset world dominated by U.S.S.R. and U.S. was made by Gen. de Gaulle.

29. H. V. Evatt, Australian delegate, announced at opening of 21-nation peace parley in Paris that he would fight any procedural rules that would limit voice of smaller nations.

30. Drafts of Allied peace treaties with Italy, Finland, Rumania, Bulgaria and Hungary were published at Paris peace conference. ¶ Disposal to overseas countries of \$3,612,177,000 worth of war materials for more than \$1,000,000,000 was announced by Thomas B. McCabe, foreign liquidation commissioner.

31. Delegates at Paris peace parley were told by Foreign Minister Molotov that U.S.S.R. opposed any outside interference in economic life of former German satellites. ¶ Pope Pius XII appealed to peace conferees in Paris to make a "just and durable" peace for Italy.

AUGUST, 1946

1. Big Four's proposal for solution of Trieste issue and Italo-Yugoslav frontiers was flatly rejected by Edward Kardelj, Yugoslav vice-premier.

2. Seventy-ninth congress adjourned after adopting Morse resolution under which U.S. would accept compulsory jurisdiction of court of international justice. ¶ U.S. veterans of World War II, equipped with arms, took over town of Athens, Tenn., after dispute over vote count. ¶ British Imperial troops from India were dispatched to Basra, in Iraq, presumably to protect British and Indian oil interests in southern Iran.

3. Drastic economy program was ordered by Pres. Truman, who directed his cabinet to reduce departmental expenditures by \$2,200,000,000.

4. Recep Peker was asked to form new Turkish government after resignation of Premier Shükrü Saracoglu and his cabinet.

5. Western powers were sharply criticized by soviet Foreign Minister Molotov, who charged U.S. and Britain sought simple majority vote at Paris peace parley because they controlled enough votes to ensure passage of their proposals.

6. China urged U.N. to postpone consideration of application of Mongolian People's Republic for membership.

- 9. Bill appropriating \$2,431,708,000 for G.I. terminal leave pay was signed by Pres. Truman. ¶ British foreign office spokesman said Britain was prepared to act without consulting U.N. if British oil interests in Iran were threatened.
- 10. Joint statement declaring settlement between Kuomintang and Chinese Communists in China appeared "impossible" was issued by Gen. Marshall and J. Leighton Stuart.
- 11. Nine white persons were held in custody on charges of "unlawful assembly" after race rioting in Athens, Ala. ¶ Numerous missiles believed to be rocket bombs streaked over Stockholm; areas from which they were launched were not known.
- 12. British government announced halt on all illegal immigration of Jews to Palestine and said would-be immigrants were to be interned in "Cyprus and elsewhere" until their fate was determined. ¶ Milan police stated body of Benito Mussolini, spirited away by Italian nationalists, had been found near Pavia monastery.
- 14. Chiang Kai-shek vowed to end one-party rule in China and set up constitutional government "without delay despite all obstacles."
- 15. Soviet attacks on U.S. foreign policy were denounced by Sec'y Byrnes.
- 19. Chinese Communist regime ordered all-out mobilization of estimated 130,000,000 people in area under its control. ¶ At least 3,000 persons were killed and many more were injured in four-day rioting between Hindus and Moslems in Calcutta.
- 20. British and U.S. notes sent to Poland complained Warsaw government was repressing democratic activities and charged serious irregularities in national referendum.
- 21. U.S. state department sent ultimatum to Yugoslav government, giving latter 48 hours to give satisfaction on shooting down of U.S. aircraft over Yugoslavia in which five U.S. fliers were killed, warning that failure to give prompt satisfaction would lead U.S. to place issue before U.N. security council. ¶ Yugoslav envoy to Greece was recalled in protest against attacks on Marshal Tito by Greek press. ¶ U.S. disapproval over soviet note to Turkey requesting that Turks share control of Dardanelles with U.S.S.R. was voiced in state department note that contended U.N. was proper authority to handle question.
- 22. Marshal Tito's promise to give satisfaction to U.S. over shooting down of U.S. planes was reported by Richard C. Patterson, U.S. ambassador to Belgrade. ¶ Greece was denounced as threat to peace by Dmitri Manuilsky, Ukrainian foreign minister, at Paris peace conference.
- 23. United Nations received Yugoslav request for return of 167 Danube river boats seized by Allied military authorities; Yugoslavs asserted seizure threatened country's economic life. ¶ Removal of Maxim Litvinov as deputy minister of foreign affairs was disclosed by Moscow radio. ¶ Britain announced it would not relinquish \$16,000,000 in Polish gold in its possession until Warsaw government fulfilled assurances that general elections would be "free."
- 24. U.S. state department said Yugoslavia seemingly had complied with ultimatum demanding satisfaction for shooting down aircraft, but reserved right to take case before U.N.; Marshal Tito charged U.S. airmen were engaged in reconnoitering Yugoslav zone of Venezia Giulia. Jawaharlal Nehru was named by Viscount Wavell to head India's new "caretaker government." Jarkey rejected U.S.S.R. request for participation in defense of Dardanelles, declaring that U.N. would be adequate guarantee of straits security. Japanese government was

ordered by Supreme Allied command to set aside 505 large plants in eight basic industries as potential war reparations.

- 26. Attorney general's office ruled that War Assets administration could transfer, legally and without cost, surplus real estate property to states.
- 27. War department disclosure that premature explosion of defective shells caused deaths of 38 U.S. soldiers was made at sessions of senate War Investigating committee.
- 28. Adm. Halsey, responding to criticism of dispatch of U.S. warships to Turkey and Greece, said it was "nobody's damn business where we go" and that "we will go anywhere we please."
- 29. Sweden, Afghanistan and Iceland were unanimously approved by security council to become members of U.N., but applications of Albania, Eire, Mongolian People's Republic and Portugal were rejected. ¶ U.N. security council was asked by soviet union to order every country with troops in non-axis states to report on number of troops and location within two weeks.
- 30. U.S. and Britain were accused by Foreign Minister Molotov of interfering in Greek elections to ensure return of monarchy. ¶ Bendix trophy air race was won by Paul Mantz, whose average speed over 2,648-mi. course from California to Cleveland was 435.6 m.p.h.
- 31. Twenty of 21 nazi defendants on trial at Nuernberg for war crimes protested their innocence in final pleas; Hans Frank publicly confessed blame for atrocities laid to him.

SEPTEMBER, 1946

- 1. Majority of Greeks voted for return of King George II in plebiscite. ¶ Tito apologized to U.S. for death of five U.S. airmen shot down over Yugoslavia.
- 3. Selling wave on New York stock exchange resulted in losses averaging from 2 to 17 points in sharpest slump in 15 years.
- 4. Companies headed by Henry M. Garsson were absolved in war department report of charge of having manufactured defective shells that caused casualties among U.S. troops during World War II. ¶ Four-day rioting between Hindus and Moslems in Bombay area resulted in 146 deaths and 557 wounded. ¶ Revised reports on two Bikini atomic bombings disclosed that only 9 of 92 ships in target area escaped sinking, damage or contamination by radioactivity.
- 5. Ukrainian charges that Britain and Greek government were responsible for terrorism in Greece, were called "unbridled propaganda" by Sir Alexander Cadogan, British representative on U.N. security council.
- 6. Early establishment of provisional centralized German government was urged by Sec'y of State Byrnes in Stuttgart speech.
- 7. Third atomic bomb test was postponed indefinitely by Pres. Truman.
- 8. Bulgarian electorate voted in favour of republic in national referendum.
- 11. Visits of U.S. warships to Greek port and continued stay of British troops in country were termed "insult to Greek people" by Andrei Gromyko, soviet delegate to U.N. security council.
- 12. Sec'y of Commerce Henry A. Wallace warned in speech at New York that "get-tough" policy with Russia would not prevent war and declared that British policy in near east combined with soviet retaliation would lead U.S. into war unless nation had clearly defined foreign

policy; in Washington, Pres. Truman said he had read and approved Wallace's speech. § U.S. would not halt U.N.R.R.A. shipments to Yugoslavia in retaliation for shooting down of U.S. aircraft, William L. Clayton, acting secretary of state, declared.

14. Pres. Truman announced full support of Sec'y Byrnes and said there had been "no change in established foreign policy" of U.S.; president said that in approving Wallace's earlier speech, he had merely approved Wallace's right to deliver it.

15. Very Rev. John Baptist Janssens, Belgian Jesuit, was unanimously elected superior general of Society of

Jesus in Rome ceremony.

16. Soviet Foreign Minister Molotov rejected Sec'y Byrnes' contention that final German-Polish frontier remained to be fixed, declaring borders were definitely established at Potsdam. ¶ Sec'y Wallace said he stood by his New York speech and that he would continue, in or out of cabinet, to fight for "just and lasting peace."

17. Trucking strike ended in New York city when majority of operators agreed to wage increases and shorter work week. ¶ Sec'y Wallace released private letter he had written to Pres. Truman July 23 urging president to seek an accord with soviet union as means of heading off atomic arms race.

18. Archbishop Aloysius Stepinatz, Catholic primate of Yugoslavia, was formally arrested by Yugoslav government and held for trial on charges of "crimes against the people." ¶ Development of powerful poison of which a single ounce would kill every person in U.S. and Canada was announced by U.S. chemical warfare service.

19. Winston Churchill proposed establishment of French-German partnership as first step toward creating United States of Europe.

20. Pres. Truman removed Henry A. Wallace as secretary of commerce; Wallace said "winning the peace is more important than high public office." ¶ U.S. state department disclosed all army and navy personnel would be removed from Iceland within 180 days, but that U.S. civilian personnel would be retained at Keflavik aerodrome to maintain communication with U.S. armed forces in Germany. ¶ Charges that Greek government policy in Balkans threatened world peace and security were dropped by U.N. security council. ¶ National Maritime union (C.I.O.) called off east coast shipping strike.

21. Strike of west coast maritime unions ended after 17-day walkout.

22. W. Averell Harriman was named secretary of commerce, replacing Henry A. Wallace.

23. U.S. abandoned its claim to full compensation for damages from Rumania at Paris peace parley.

24. Soviet request that U.N. members report exact number and location of their armed forces in all but former axis states was rejected by seven to two vote in security council. ¶ Premier Stalin said he did not believe in real danger of "new war" and said power of atomic bombs would not determine outcome of future war. ¶ U.S. government was asked by Yugoslav government to close its information service in Belgrade on grounds it was distributing propaganda inciting Yugoslavs to "open treason."

26. Pres. Truman said he would not ask for permanent decontrol or temporary moratorium on meat price ceil-

ings.

27. U.S. refusal to return Danubian river craft, to Czechoslovakia and Yugoslavia was branded as direct intervention in affairs of Danubian states by soviet dele-

gate at U.N.E.S.C.O. meeting. ¶ Foreign Sec'y Ernest Bevin declared his agreement with Premier Stalin that there was no real danger of war, but appealed for cessation of diplomatic war of nerves.

28. King George II returned to Athens to resume role as monarch of Greece. ¶ Turkey was warned by U.S.S.R. that if it agreed on military measures in Dardanelles area with any power not on Black Sea, soviet union would regard such action as threatening security of other Black Sea nations. ¶ Premier Ismail Sidky Pasha resigned, presumably over failure to reach agreement in Anglo-Egyptian talks.

29. Gen. de Gaulle denounced French constitution draft as "compromise unworthy of Republic."

30. Sec'y of Navy Forrestal said U.S. naval forces in Mediterranean and Eastern Atlantic were there to support U.S. foreign policy.

OCTOBER, 1946

1. Twelve of nazi defendants convicted of war crimes were sentenced to death on gallows by International Military Tribunal at Nuernberg; three received life imprisonment, four were given lighter sentences and three—Franz von Papen, Hjalmar Schacht and Hans Fritzsche—were acquitted. ¶ U.S. navy plane "Truculent Turtle" set record for nonstop long-distance flight, completing 11,236-mi. trip from Perth, Australia, to Columbus, O., in 55 hrs., 15 min. ¶ Iranian government asked Britain to recall its embassy secretary from Tehran, on charges that he was involved in revolt of south Iranian tribesmen.

3. Henry Wallace was strongly criticized by Bernard M. Baruch, U.S. delegate on U.N. atomic energy commission, for refusal to correct "errors" in his July 23 letter on atomic energy to Pres. Truman. ¶ Gen. Omar N. Bradley criticized John Stelle, American Legion commander, at Legion convention in San Francisco, declaring Stelle had "impaired our progress by deliberately misrepresenting our objectives." ¶ Director John R. Steelman of OWMR warned in quarterly report that further price rises might lead to price collapse. ¶ Sec'y of State Byrnes voiced hope that Premier Stalin's statement that there was no danger of immediate war would end "unwarranted charges" that U.S. was using atomic weapon as threat against soviet union.

4. Pres. Truman reiterated request to Prime Minister Attlee of Britain to open Palestine "at once" to permit "substantial" immigration of displaced Jews. ¶ British Labour government announced formation of new ministry of defense, intended to co-ordinate army, navy and air services, with Albert V. Alexander as its head. ¶ Twenty-three of 25 Negroes accused of participating in race disorders at Columbia, Tenn., were acquitted by all-white jury in trial at Lawrenceburg, Tenn.

5. Winston Churchill warned that destiny of India might lie in soviet, not British, hands. ¶ Agreement with U.S. permitting Americans to use Keflavik airdrome was ratified by 32 to 19 vote in Iceland parliament.

6. U.S. Superfortress, "Pacusan Dreamboat" completed 9,500-mi. flight from Hawaii to Cairo in 39 hr., 36 min.

9. Indemnity of \$150,000 for lives of five U.S. pilots killed when their plane was shot down over Yugoslavia was paid to U.S. by Yugoslav government, state department disclosed. ¶ State department reiterated its support of Turkey in Dardanelles controversy in note delivered to soviet foreign office.

10. Draft of Rumanian treaty, which included provisions for free navigation on Danube and equal trade opportunities in Danubian nations, was approved at Paris

peace parley. ¶ Pres. Truman flatly declared that Great Britain did not have any atomic bombs, in denial of reports that Britain was stockpiling atomic weapons. ¶ Kuomintang's standing committee extended Chiang Kaishek's tenure as president for another three years.

11. Capture of Communist base of Kalgan in north China by Chinese Nationalist armies was announced by Chinese government source. ¶ Draft of Bulgarian peace treaty was approved by conferees at Paris peace parley. ¶ Yugoslav court in Zagreb sentenced Archbishop Stepinatz to 16 years in prison on charges of having actively collaborated with axis powers during war.

12. Announcement that U.S. would pay Italy \$50,000,000 for lire furnished to U.S. army for purchasing supplies in

Italy was made by Sec'y of State Byrnes.

13. Draft of new constitution was approved by French electorate by majority of about 1,000,000 votes. ¶ Draft of Hungarian peace treaty was approved by conferees at Paris peace parley.

- 14. Adoption of draft of Finnish peace treaty terminated work of Paris peace parley; Vyacheslav Molotov, soviet foreign minister, termed as "unsatisfactory" some of results of conference. ¶ Vatican dissatisfaction with sentence passed on Archbishop Stepinatz was reflected in its decision to excommunicate all persons who contributed morally or physically to "crimes" that resulted in his arrest and sentencing. ¶ All price controls on livestock and meat were removed, effective Oct. 15, by Pres. Truman, who blamed meat shortage on "reckless group of selfish men."
- 15. Paris peace conference closed after 11 weeks and 2 days of sessions in Luxembourg palace. ¶ St. Louis Cardinals defeated Boston Red Sox 4-3, in seventh and deciding game of baseball's annual world series.
- 16. Ten leading nazis were hanged in prison gymnasium at Nuernberg; Hermann Goering committed suicide by swallowing poison less than two hours before he was slated to hang. ¶ U.S. state department stopped remaining \$40,000,000 of \$50,000,000 credit granted Czechoslovakia for purchasing surplus army equipment and asked Export-Import bank to stop negotiations for another \$50,000,000 credit, charging Czechoslovakia had resold some material to Rumania at profit. ¶ Chiang Kai-shek issued eight-point peace bid to Chinese Communists, declaring he would promptly give cease-fire order if Communists accepted his procedure for resuming peace parleys.
- 17. OPA removed all price controls from coffee. ¶ King Ibn Sa'ud of Saudi Arabia wrote Pres. Truman that U.S. request to open Palestine immediately to Jewish immigration violated "previous promises" made to Arabs.
- 18. Sec'y of State Byrnes, in broadcast on results of Paris peace parley expressed concern over "continued, if not increasing" U.S.-Russian tension but decried idea that conflict was inevitable. ¶ State department charged that Yugoslav government held individuals in forced labour and urged prompt "remedial" measures.

20. Moscow radio attacked U.S. congress as tool of "reactionary" interests and expressed hope that voters at Nov. 5 elections would elect "progressive" candidates.

21. 1,400 pilots and co-pilots of Transcontinental and Western Air, Inc., staged first strike in air line history. ¶ John L. Lewis accused government of violating contract with soft coal miners and demanded reopening of contract for new negotiations on wages. ¶ Social Democratic party emerged as strongest political party in Berlin's municipal elections, receiving about 49% of votes cast; Christian Democratic Union was second and Socialist Unity party, sponsored by Russians, was third. ¶ Soviet

delegate to U.N. atomic energy commission proposed world-wide report on uranium deposits as basic step toward control of atomic energy. ¶ U.S. request that Big Three take measures to guarantee free elections in Bulgaria was rejected by soviet union, state department disclosed.

22. Argentine action in halting nearly all food exports to Bolivia was linked with Perón government's displeasure with ouster of Villarroel dictatorship and establishment of democratic regime by Bolivia.

- 23. Pres. Truman, opening first session of U.N. general assembly in New York, said elimination of fear of war was world's principal need, warning that world disaster would follow if U.N. should be split into "irreconcilable parts" by conflicting ideologies. ¶ All foods and beverages, except sugar, rice, molasses and syrups, were removed from price controls by OPA.
- ' 24. U.N. general assembly was told by Secretary General Trygve Lie that Franco regime in Spain would be constant source of mistrust among U.N. members so long as it remained in power. ¶ Gabriel Gonzales Videla was confirmed by senate as president of Chile for six-year period.

27. Government-sponsored Fatherland Front bloc won overwhelming majority in Bulgarian national elections; party gained 364 seats to 101 for opposition.

- 28. Premier Stalin, in interview with U.S. correspondent, said soviet union did not have secret of atomic bomb. § U.S. and Britain were accused by Kuzma Kisselev, White Russian delegate to U.N., of violating U.N. charter by maintaining armies in non-axis countries. § Rumania was accused by U.S. state department of using methods that would prevent free and fair elections scheduled for Nov. 19. § Pres. Truman named five civilians to head U.S. atomic energy commission, with David E. Lilienthal as chairman of new body.
- 29. U.S. plan for world control of atomic energy was rejected by soviet Foreign Minister Molotov, who urged U.N. to take prompt action to reduce armaments and ban atomic missiles.
- 30. Soviet proposal for world-wide reduction of armaments was endorsed by Warren R. Austin, U.S. delegate on U.N. general assembly, who added, however, it would require effective enforcement provisions. ¶ Chancellor Leopold Figl was instructed by Austrian parliament to press for full restoration of Austrian sovereignty and termination of Allied occupation.
- 31. President-elect Gabriel Gonzales Videla of Chile appointed three Communists to his cabinet.

NOVEMBER, 1946

- 1. Belgium, Netherlands and Luxembourg requested Big Four powers to sit in on discussions of German peace treaty.
- 2. Pres. Truman declared in speech at Kansas City that "atomic bomb has made war so terrible that we simply cannot have another one."
- 3. New Japanese constitution was formally promulgated by Emperor Hirohito. ¶ Zionist settlers and Arab villagers clashed over land claim in northeast Palestine; two Jews and two Arabs killed. ¶ Gabriel Gonzalez Videla was inaugurated as president of Chile for six-year term.
- 5. Republicans gained control of U.S. congress in national elections, gaining 12 seats in senate (total of 51 to 45 for Democrats) and 57 seats in house of representatives (249 to 185). ¶ Molotov accused Sec'y of State Byrnes of threatening to withhold reparations from Yugo-

slavia if latter nation refused to sign Italian peace treaty.

6. President Truman disclosed U.S. proposal under which strategic Pacific islands would be placed under U.N. trusteeship provided U.S. remained sole administering authority. § Rep. J. W. Fulbright (Dem.) of Arkansas proposed that Pres. Truman appoint Republican secretary of state and resign.

7. John Foster Dulles notified U.N. that if it failed to accept U.S. trusteeship proposals for control of Pacific islands, U.S. would continue de facto control of strategic

areas.

- 8. U.S. mission to Albania was withdrawn after charges that Premier Enver Hoxha's regime was unwilling to recognize validity of existing treaties.
- 9. End of all controls on prices, wages and salaries, save for curbs on rent and sugar, announced by Pres. Truman.
- 10. French Communists won largest number of seats in elections for the first national assembly under new constitution; Popular Republican Movement was second and Socialist party third.
- 11. Pres. Truman admitted that G.O.P. control of legislative branch of government and Democratic control of executive would result in inevitable division but said friction could be avoided if nation's interest was put ahead of party politics. ¶ Attitude of compromise in council of foreign ministers was reflected in Sec'y Byrnes' announcement that U.S. had agreed to return of Danubian ships and barges to owner states, and in Foreign Minister Molotov's disclosure that U.S.S.R. had restored identifiable property within soviet zones to foreign owners.
- 12. Large U.S. expedition to Antarctica involving 4,000 men and dozen vessels, commanded by Adm. Byrd, announced in Washington. ¶ Establishment of "task fleets" in both Atlantic and Pacific was announced by U.S. navy department.
- 13. Field Marshal Jan C. Smuts warned that if U.N. failed to approve Union of South Africa's proposal to annex South West Africa mandate, South Africa would continue to administer mandate anyway. ¶ Andrei Gromyko, in U.N. address, denounced use of food as political weapon.
- 14. Albanian Premier Hoxha charged U.S. used issue of treaty validity to obstruct resumption of U.S.-Albanian relations. ¶ Nobel Peace prize for 1946 was won by Dr. John R. Mott and Prof. Emily Greene Balch of U.S.; chemistry award went to Professors James Batcheller Sumner, Wendell M. Stanley and John Howard Northrop of U.S.; physics award to Prof. Percy Williams Bridgman of U.S.; the literature prize was awarded Herman Hesse, Swiss novelist.
- 15. John L. Lewis formally notified government that union's coal pact with federal government would be terminated Nov. 20. ¶ Plan for recognition of de facto authority of Indonesian republic over islands of Java, Sumatra and Madura and establishment within two years of United States of Indonesia under co-equal Netherlands-Indonesian union was initialled in Batavia by Netherlands and Indonesian delegations.
- 16. Recommendations for stripping Japanese industry of its war-making potentialities were contained in Edwin Pauley's report to Pres. Truman.
- 18. U.S. government obtained restraining order to prevent John L. Lewis and United Mine Workers from starting strike in alleged violation of government contract. § Foreign Secretary Bevin's foreign policy was endorsed

by 353 to 0 vote in house of commons, with estimated 100 Labourites abstaining from voting. ¶ Marshal Ivan S. Konev was appointed commander in chief of all soviet ground forces to succeed Marshal Georgi K. Zhukov.

19. Radio broadcasting by foreign correspondents was

formally abolished by soviet government.

20. John L. Lewis and U.M.W.A. defied federal injunction restraining them from cancelling government contract as coal miners began scheduled strike.

- 21. Federal court in Washington, D.C., ordered John L. Lewis and U.M.W.A. to show cause why they should not be held in contempt for ignoring government injunction against coal strike. ¶ Britain's willingness to accept soviet proposal for census of all armed forces outside its own border provided it was linked to general disarmament plan, was announced before U.N. by Foreign Sec'y Bevin.
- 2°. Pres. Bierut of Poland said Catholic Church would continue to enjoy its rights in Poland if clergy would work with new government.
- 24. French Communist party again won largest number of votes in national balloting for selection of electoral college for Council of the Republic. ¶ Twelve U.S. army personnel and civilians, stranded by plane crash on Gauli glacier in Switzerland, were rescued by two Swiss pilots in ski-equipped planes.
- 25. Interagency commission designed to weed out "disloyal" and "subversive" personnel among federal employees was announced by Pres. Truman.
- 26. Molotov submitted request to U.N. that information on manufacture of atomic weapons be included in any future disarmament conference.
- 27. Council of Foreign Ministers reached agreement on status of Trieste. ¶ Resolution that would require all 54 U.N. member states to submit reports on total of armed forces, both at home and abroad, by Jan. 1, 1947, adopted by U.N. political and security committee; soviet proposal to include information on armaments, including atomic bombs and rocket weapons, was defeated; the principle of world inspection and control as means of checking compliance with proposed plan for general disarmament was accepted by Foreign Minister Molotov next day.
- 28. U.N. general assembly subcommittee upheld by ten to five vote right of administering states to establish military bases in territory held under trusteeships with approval of security council. ¶ Sec'y of State Byrnes denied charge of Dmitri Manuilsky, Ukrainian foreign minister, that shooting of Gregory Stadnik, Ukrainian delegate to U.N., in New York food shop, was premeditated plot or had any political implications.
- 29. Andrei Vishinsky told U.N. political and sccurity committee that U.S.S.R. did not intend to renounce principle of "unanimity" of great powers. ¶ Rapid soviet troop demobilization in eastern Germany disclosed by generally reliable sources in Berlin. ¶ Paul Porter resigned as OPA director.
- 30. Col. Gcn. Eberhard von Mackensen and Lt. Gen. Kurt Maelzer were found guilty and sentenced to death by British military court in Rome for having caused death, in March 1944, of 336 Italian civilian hostages in Ardeatine caves.

DECEMBER, 1946

- 1. Miguel Alemán was inaugurated president of Mexico. ¶ Report of senate War Investigating committee on conditions in U.S. zone of Germany charged U.S. forces with widespread misconduct.
- 2. Anglo-U.S. pact for economic merger of respective zones in reich was signed by Sec'y of State Byrnes and

Foreign Minister Bevin. ¶ Sen. Tom Connally warned U.N. that U.S. would not "tolerate any veto" that would block effective functioning of system for world inspection and control of armaments. ¶ Lea act was ruled unconstitutional by federal judge in Chicago, who dismissed criminal charges under its provisions against James C. Petrillo of American Federation of Musicians.

- 3. Workers in all nations would take action to help Spanish people overthrow Franco if U.N. failed to take positive measures, declared Leon Jouhaux, French trade union leader, in speech before U.N. political and security committee. ¶ President Truman rejected proposed probe of U.S. military government in Germany as unnecessary. ¶ Oliver Max Gardner, undersecretary of treasury, was named U.S. ambassador to Great Britain.
- 4. John L. Lewis was fined \$10,000 and United Mine Workers of America \$3,500,000 for contempt of court by Judge Goldsborough of federal court in District of Columbia; criminal contempt proceedings against Lewis were dropped at government's request. ¶ Wilson W. Wyatt resigned as National Housing administrator. ¶ Foreign Minister Molotov clarified veto issue on arms inspection proposal, declaring U.S.S.R. did not intend that security council should have veto over actual control activities.
- 5. Bernard Baruch urged soviet union to join other U.N. members in accepting new U.S. plan for international atomic control, pleading that "to delay may be to die." § John D. Small resigned as director of Civilian Production administration.
- 6. Indian conference in London ended in failure over Pakistan issue; British Labour government indicated it would not accept any constitution for India not drafted with help of Moslems. § Interstate Commerce commission approved average increases of 17.6% in rail and water carrier freight rates and charges. § Hussein Ala, Iranian ambassador to U.S., informed U.N. security council that Iran had decided to send troops into Azerbaijan province despite "friendly" soviet advice. § Dr. Julian Huxley was elected director-general of U.N.E.S.C.O. for two years.
- 7. John L. Lewis called off coal strike, ordering miners to continue working until April 1, 1947. ¶ Dr. Le Van Hoach was sworn in as new president of provisional government of Republic of Cochin-China.
- 8. Over-riding British and U.S. objections, U.N. general assembly adopted by 32 to 15 vote resolution supporting India's charges that South Africa practised racial discrimination against Indian nationals living there. § Ismail Sidky Pasha resigned as premier of Egypt.
- 9. U.S. supreme court granted justice department's petition to decide appeal in case of John L. Lewis and U.M.W.A. ¶ Resolution denouncing Franco Spain and urging members of U.N. to recall their envoys from Madrid, was passed by 23 to 4 vote in general assembly's political and security committee. ¶ Council of Foreign Ministers agreed to hold following session in Moscow beginning March 10, 1947, to draft peace settlements for Germany and Austria. ¶ Mahmoud Fahmy Nokrashy Pasha, leader of Saadist party, was named by King Farouk to form new Egyptian cabinet.
- 10. Establishment of inspection body exempt from veto to check both armaments and armed forces was proposed by Britain in U.N. general assembly.
- 12. General assembly of U.N. approved, 34 to 6, resolution requesting member states to withdraw diplomatic missions from Spain. ¶ Yugoslavia, Albania and Bulgaria were accused by Greek Premier Tsaldaris of supporting organized border raids against his country. ¶ Léon Blum

was named premier of France, receiving 575 out of 590 votes in national assembly.

- 13. Resolution urging great powers to employ strong means to prevent use of veto from blocking security council's effort to reach prompt decision was passed by 36 to 6 vote in U.N. general assembly. ¶ Secretary of State Byrnes disclosed that U.S. had 550,000 troops abroad, mostly in Germany, Japan, Korea, Austria and Venezia Giulia. ¶ Agreements under which U.N. would accept trustee administration of eight territories formerly under League mandates were voted by U.N. general assembly; trusteeship council was completed Dec. 14. ¶ Manchurian industries suffered "appalling" damage during soviet occupation, Edwin W. Pauley, U.S. reparations representative, charged in report to Pres. Truman.
- 14. Pres. Truman removed numerous restrictions on housing and relaxed other building curbs. ¶ U.N. general assembly voted 46 to 7 to accept John D. Rockefeller, Jr.'s offer of site in New York city as permanent headquarters. ¶ World disarmament resolution was voted by U.N. general assembly, but soviet request for troop census was deleted from bill; assembly rejected South African request to annex South West Africa mandate.
- 15. Siam became 55th member of U.N., receiving unanimous vote in U.N. general assembly.
- 16. Cabinet composed solely of Socialists was formed by French Premier Léon Blum.
- 17. Harold Stassen formally announced his candidacy for G.O.P. presidential nomination; Sen. Vandenberg declared he was not a candidate.
- 19. Attlee government announced new measure which would give government broad authority over agriculture and would guarantee in return stable prices, fair wages and adequate living conditions.
- 20. Alterations in size and arms of U.S. army divisions to meet changes of atomic age were announced by Gen. Jacob L. Devers, commander of U.S. army ground forces. ¶ Severe fighting broke out between French forces and troops of Viet Nam republic at outskirts of Hanoi. ¶ Prime Minister Attlee told house of commons that Britain would offer Burma independence on same terms as India; Churchill attacked proposal, declaring it signified another step in "decline and fall of British empire."
- 21. Announcement that Sir Victor Mallet, British ambassador, had been instructed to leave Madrid "at earliest possible moment" was made by British foreign office.
- 22. Foreign Sec'y Bevin denied Britain was tied to U.S. foreign policy or was antipathetic to soviet union. ¶ Viet Nam forces extended military operations throughout northern Indo-China.
- 23. Premier Léon Blum disclosed French government would send Gen. Leclerc to Indo-China on military inspection mission; he also reaffirmed France's recognition of Viet Nam's independence. ¶ French action in setting up customs barrier between Saar and rest of Germany was denounced by Gen. Clay.
- 24. Informal advisory board on labour problems was announced in Washington; group included Secretaries Schwellenbach, Clark and Harriman; John R. Steelman, reconversion director; Paul M. Herzog, NLRB chairman and Clark Clifford, special counsel to president. ¶ More than 800,000 Germans subject to denazification trials were amnestied by Gen. Joseph T. McNarney.
- 25. Permanent constitution was voted by Chinese National assembly in Nanking; Chinese Communists, boycotting assembly, said they would not recognize charter.

27. George E. Allen resigned as director of Reconstruction Finance corporation, effective Jan. 16, 1947.

28. Gen. de Gaulle announced he would not be candidate for presidency of new French republic because of dissatisfaction with new constitution.

29. Liberal groups from 21 states voted to merge into new political action body called "Progressive Citizens of America." ¶ Jewish terrorists in Palestine flogged four British soldiers in retaliation for judicial lashing of captured terrorist by British.

30. Plan for world control of atomic energy conforming with original Baruch proposals was adopted by 10 to 0 vote in U.N. atomic energy commission; soviet union and Poland abstained from voting.

31. National state of hostilities in World War II ended by President Truman, who emphasized that state of war and state of emergency proclaimed by Pres. Roosevelt in 1939 and 1941 were still in force; proclamation terminated 18 wartime statutes.

Chungking

Situated on the banks of the Yangtze Kiang river above the Ichang gorges, Chungking, China, though it is the most important settlement in far-off Szechwan province, never amounted to much, internationally speaking, until a geological accident brought it into political prominence in 1938. Up to this time Chungking had existed mainly on river traffic. U.S. and British importers and exporters, oilmen and shippers maintained offices and trading posts in Chungking because of its position as the last stop of importance on the river, and gunboats of both nations plied between Chungking and Shanghai regularly in high-water season. During the Chinese-Japanese war, however, the fact that Chungking was built on hard rock became very important to the Chinese. The national government, fleeing its temporary refuge at Hankow just ahead of the Japanese invaders, selected the Szechwan city as the new site for its capital, and settled in about Oct. 1938. Chungking's foundations are solid and the underlying rock is full of caves which could serve as air-raid shelters by being extended; new caves also were dug. Moreover, the town's peculiar location on a wedge-shaped slice of land among the Szechwan mountains just at the confluence of the Yangtze Kiang and Chianling rivers, made it difficult for Japanese bomber pilots to approach unobserved. After the government moved in, Chungking swelled to enormous proportions. Accurate statistics were unobtainable, but the population certainly reached figures of several millions. It became one of the world's leading capitals, sustaining terrific bombings until the end of 1941, and remained the capital city of China until the end of the war in 1945, when a general exodus of the victorious government was begun back to Nanking. Presumably Chungking would resume her former status as a lazy river port on the Yangtze Kiang, but scarcely an original building remained after the terrific Japanese bombings of the war years. The plaster-strewn ruins of the old city, interspersed with stubborn, never-ceasing activity, as the Chinese persisted in building their homes anew after each raid, stood as a symbol of the long siege. The total population as indicated in the registration for residents' identification cards was around 1,000,000 at the end of 1942.

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Churches, World Council of

See Christian Unity; Religion.

Churchill, Winston Leonard Spencer

Churchill (1874—), British statesman, was born Nov. 30, 1874, at Blenheim palace, Oxfordshire, England. His father was Lord Randolph Churchill; his mother, Jennie Churchill, was the daughter of Leonard Jerome of New York city. Educated at Harrow and Sandhurst, he joined the army and served in two British campaigns in Africa in 1895 and 1897. While covering the Boer War (1899–1902), as a correspondent for the London Morning Post, he was taken prisoner by the Boers but later escaped.

Churchill was first elected to parliament in 1900 as Conservative member for Oldham. When the Conservatives abandoned the principle of free trade, Churchill left the party and joined the Liberals in 1904. Two years later (1906), he was returned to parliament as Liberal M.P. He was undersecretary for the colonies in the Campbell-Bannerman government, 1905-08. In 1911, after the Agadir incident led to increasing Anglo-German tension, Churchill was appointed first lord of the admiralty. He was credited with many reforms and with having fully prepared the royal navy for the outbreak of war in 1914. Despite opposition of high naval officers, Churchill carried out his cherished project, the Dardanelles campaign, in 1915. The resignation of Lord Fisher, who had disapproved of the venture, was one of the contributing factors to the downfall of the Liberal government, and Churchill lost his post at the admiralty.

Subsequently Churchill defended the Dardanelles campaign as a legitimate war gamble and blamed Lord Fisher for not voicing his disapproval in the war council. Following his departure from the cabinet, he went to France, where he commanded the 6th Royal Scots Fusiliers.

Lloyd George, returning to power in 1917, recalled Churchill to the government, first as minister of munitions and then as secretary for war and air minister (1918–21). However, Lloyd George disapproved of the costly British intervention in Russia, undertaken at Churchill's inspiration, and shifted his colleague to the colonial office in 1921. The following year (1922), Churchill was defeated for parliament by his Dundee constituents.

After two years of retirement, during which he took to painting and writing, and completed the first of his four-volume work World Crisis, 1916–18, he rejoined the Conservative party and was elected to parliament in 1924 from the Epping division. In the second Baldwin administration, he was chancellor of the exchequer (1924–29) and was rector of Edinburgh university, 1929–32. In the following period from 1933 to 1938, his monumental four-volume work, Marlborough, was published.

During the historic decade 1937-46, Churchill emerged as a statesman of world stature. He was quick to recognize that Hitler's naziism could not be localized as a purely German domestic problem; that it extended beyond reich borders and threatened the peace of all Europe. This aspect of the German problem was not seen by the leaders of the MacDonald, Baldwin or Chamberlain governments in the 1930s. In the years 1936 to 1938, he warned against German rearmament. He pleaded (May 25, 1938) with Britain to build up the royal air force, urged implementation of Britain's national security and strengthening of its air defenses. In the commons debate on the government's request for approval of the Munich agreement, Churchill denounced the pact and assailed France and Britain for having failed to maintain closer contact with the soviet

union. He assailed the Chamberlain government (June 28, 1939) as a regime that tried to "buy off nazidom."

Although there was no love lost between the two men, Chamberlain at the outbreak of war, Sept. 3, 1939, put Churchill in the cabinet, in his old office of first lord of the admiralty. On May 10, 1940, when the fateful German push into the Low Countries and France had begun, Churchill superseded Chamberlain as prime minister. Three days later (May 13), he made his celebrated speech to commons in which he told his countrymen that he had nothing to offer them but "blood, toil, tears and sweat." The rapid succession of Allied military disasters that followed brought out Churchill's qualities of leadership. His dynamic speeches and strong conviction of ultimate victory helped to bolster morale at one of the most critical moments in the empire's history. After the evacuation of Dunkirk, he promised (June 4, 1940) that Britain would fight on alone "whatever the cost may be," and expressed confidence that "in God's good time, the New World, with all its power and might," would step forth "to the rescue and the liberation of the old." As the war progressed, with new disasters befalling the Allies on nearly all battle fronts, Churchill in his public addresses and reports to parliament on the war situation frankly acknowledged the gravity of Britain's danger, but invariably pointed up the nation's will to resist.

Although British military reverses in 1941 brought forth an increasing stream of criticism from the opposition, Churchill's personal popularity remained great. This was reflected in the 447 to 3 vote of confidence that he received from commons on May 7, 1941, despite the severe defeats suffered by British arms in Libya and Greece. His conduct of relations with the U.S. was marked by both tact and candour; he openly confessed in his speech, Dec. 26, 1941, before the joint session of congress in Washington, that "if the United States has been found at a disadvantage at various points in the Pacific ocean, we know well that that is to no small extent because of the aid which you have been giving to us in munitions for the defense of the British Isles and for the Libyan campaign, and above all, because of your help in the Battle of the Atlantic." At the same time, he did not hesitate to insert the "due respect for their existing obligations" clause-point four-in the Atlantic Charter which he and President Roosevelt drafted in Aug. 1941.

To critics who subsequently charged that preservation of the British empire was not a legitimate war aim, Churchill retorted Nov. 10, 1942, that he did not intend to "preside over the liquidation of the British empire."

Equally frank were the expressions of his feelings toward the U.S.S.R. and Japan. When Germany invaded the soviet union, June 22, 1941, Churchill declared: "Any man or state who fights nazism will have our aid." At the same time he refused to modify his frequently expressed opposition to communism in the political sphere. Regarding Japanese plans for a "new order" in eastern Asia, he twice warned the Tokyo government in 1941 that Great Britain would declare war immediately in the event of a Japanese attack on the U.S. This promise was fulfilled Dec. 8, 1941, the day after Pearl Harbor.

Military reverses in Burma, Malaya and Hong Kong rocked his government in the first months of 1942. Churchill, demonstrating his customary skill in oratory and parliamentary adroitness, silenced his critics with a 464 to 1 vote of confidence on Jan. 29, 1942. Subsequently, in a speech delivered to a secret session of the house of commons, Apr. 23, 1942, he declared that from the start of the war, he had always hoped for entry of the United States.



"Dropping the Pilot," cartoon by Bishop of the St. Louis Star-Times on the resignation of Winston Churchill, British prime minister during World War II, after the Conservative party was defeated in the general election of July 1945

After the fall of Singapore, he dropped (Feb. 22, 1942) those ministers from his cabinet branded as "incompetents" by the opposition. On June 27, during his second trip to Washington, Churchill and Roosevelt jointly declared that the Allies would open military operations to divert nazi strength from the Russian front. He conferred with Premier Stalin on these proposals in Moscow in Aug. 1942.

The year 1943 was one of great personal triumph for Churchill. His arch-foe Hitler had been driven out of Africa. Mussolini vanished as a political figure of importance. Allied armies scored victories in both Europe and Asia. The planning and preparations that led to these and subsequent successes were laid down, for the most part, in the six major conferences Churchill attended in that year. They were the Casablanca conference (Jan. 15–24) with Roosevelt; the Washington conference, which started May 11, with Roosevelt; the Quebec parleys in August with Roosevelt; the Cairo conference, Nov. 22–26, with Chiang Kai-shek and Roosevelt; the Tehran conference, Nov. 28–Dec. 1, with Stalin and Roosevelt, and the second Cairo parley, Dec. 4–6, with Roosevelt and President Ismet Inönü of Turkey.

For the first time since he had taken office, Churchill faced serious opposition in 1944. Both Labourites at home and "liberal" elements abroad disapproved of Churchill's support of "reactionary" political elements in Belgium, Italy and Greece. During that year, Churchill participated in two important conferences abroad—one in September with Roosevelt in Quebec for discussion of further global strategy and the other in October with Stalin in Moscow, where the discussion centred on Balkan and Polish policy.

In 1945, the original "Big Three"—Churchill, Roosevelt and Stalin—met for the last time at Yalta (Feb. 4-11). Churchill then conferred with Roosevelt at Malta. This was his last meeting with Roosevelt, who died April 12.

Following the defeat of Germany, the Labourite opposition broke with the government and on May 25, 1945, Churchill reorganized his government without the Labour

party members and led the Conservative electoral campaign. After announcement of the Labourite victory in the national elections (July 26) Churchill, who was attending the Potsdam conference with Stalin and President Truman, relinquished his seat to Clement Attlee, his successor, and became leader of his majesty's opposition.

After the close of World War II, Churchill became increasingly critical of soviet foreign policy. His attitude was reflected in his speech March 5, 1946, at Westminster college in Fulton, Mo., where he called for an Anglo-U.S. "fraternal association" to halt the "expansive and proselytizing tendencies" of the U.S.S.R. The Fulton speech created an international furore; while lauded by anti-soviet factions among the western powers, it was denounced by anti-British and pro-soviet elements in the United States. Pres. Truman, who was present on the platform at the college auditorium, later hastened to deny that his attendance signified his endorsement of Churchill's views.

In another speech in New York city, on March 15, 1946, Churchill reiterated his appeal for an Anglo-U.S. "fraternal association," but added that he did not believe a war with Russia was inevitable or that the rulers of the soviet union wanted a war "at the present time."

The two Churchill talks in the United States received world-wide publicity; the Labourite government in Britain emphasized that Churchill in no way spoke for the government. Meanwhile, Stalin denounced his former wartime ally as a "warmonger." On his return home, Churchill continued his attacks on the Labour government's domestic policy, but largely endorsed its foreign policy.

Church Membership

At the end of the decade 1937–46, the latest reliable figures of U.S. church membership were for the year 1944, published in the 1945 Yearbook of American Churches, compiled under the auspices of the Federal Council of the Churches of Christ in America. The total reported church membership was 72,492,669, or 52.5% of the estimated population. (See Table II.) This was the largest total church membership and the highest proportion of church membership in the total U.S. population ever reported.

Table	1-115	Religious	"Families "	7011

Family	Number of Bodies	Inclusive Membership
Roman Catholic	1	23,419,791
Baptist	23	14,207,775
Methodist	20	10,629,280
Lutheran	20	5,129,147
Jewish	1	4,641,184
Presbyterian	10	2,933,768
Protestant Episcopal	1	2,227,524
Disciples	2	1,981,905
Congregational	1	1,075,401
Latter Day Saints	7	987,315
Reformed	4	979,388
Eleven denominational families	90	68,212,478
Other denominations	166	4,280,191
All denominations	256	72,492,669

The picture will be brought into clearer focus if we remember that the denominations could be grouped in "families," each containing a number of bodies which were separately organized but went back, more or less directly, to a common origin. There were 11 such U.S. "families" in 1944, according to the 1945 Yearbook, with a membership of 1,000,000 or more members each, as indicated in Table I.

In the Christian Herald for June 1946, there was published an incomplete compilation of official reports of church membership for 1945, confined to the 55 denominational bodies with more than 50,000 members each. This

report showed a total for these bodies of 71,700,142 members, which represented a net gain over the previous year of 1,076,153. The net Protestant gain for the year was 507,167; the net Roman Catholic gain was 543,970. The Jewish congregations took no new survey.

(L. A. WE.)

Table II.—Church Membership in the United States in 1944*

Table III— should member ship iii ii	Chah	Inclusive	13 years
Body	Churches	membership	or over
Adventists, Seventh Day	2,531 5,05 5	194,832 227,349	194,832 227,349
Baptist Bodies:			
American Baptist Association	1,064	115,022	93,955
Free Will Baptist	1,102	118,871	117,130
National Baptist Convention	24,460 7,286	4,021,618	3,700,078
National Baptist Convention of America	7,280 451	2,352,339 59,743	2,117,091 48,137
National Baptist Evangelical assembly	7,348	1,555,914	1,478,111
Northern Baptist	1,726	69,157	68,881
Southern Baptist	25,965	5,667,926	5,384,530
United American Free Will Baptist	350	75,000	66,000
Brethren (Dunkers)	1,019	180,287	176,100
Church of Christ, Scientist	2,113	268,915	268,915
Church of God (Anderson, Ind.)	1,412	83,875	71,293
Church of God (Cleveland, Tenn)	1,817	67,137	67,137
Church of God in Christ	2,000	300,000	250,000
Church of the Nazarene	2,965	187,082	187,082
Congregational Christian Churches	3,815 5,753	309,551 1,075,401 1,672,354	309,551 1,075,401
Disciples of Christ	5,753 7,917	1,672,354	1,504,115
Disciples of Christ	1,994	255,881	1,504,115 249,241
Evangelical and Reformed	2,835	675,958	675,958
Federated Churches	508	88,411	88,093
Friends (Five Years' Meeting)	453	70,000	58,350
Independent Fundamental Churches	600	60,000	60,000
Latter Day Saints:	1,757	870,346	720 445
Church of Jesus Christ of Latter Day Saints. Reorganized Church of Jesus Christ of Latter	-	87 0,340	728,665
Day Saints	563	113,064	102,071
Lutherans:			
American Lutheran	1,834	584,499	413,289 279,530
Augustana Lutheran	1,123 4,073	373,163	2/9,530
Missouri Lutheran	2,522	1,356,655 595,034	948,371 422,383
United Lutheran	3,762	1,690,204	1,213,985
Wisconsin Lutheran	914	324,492	191,008
Mennonite	500	51,813	50,000
Methodist Bodies:		•	
African M.E	7,265	868.735	667,035
African M.E. Zion	2,252	868,735 489,244	382,316
Colored M.E	4,400	382,000	321,000
Methodist	41,067	8,046,129	7,400,000
Presbyterian Bodies			
Cumberland Presbyterian	1,048	64,984	44,786
Presbyterian, U.S. (South)	3,500	565,853	519,157
Presbyterian, U.S.A	8,462	2,040,399	1,960,399
United Presbyterian	847	193,637	174,273
Protestant Episcopal	7,894	2,227,524	1,501,777
Reformed Bodies			
Christian Reformed Church	310	128,914	71,831
Reformed Church in America	736 1,474	169,390	169,390
International General Assembly of Spiritualists	236	208,329 100,000	91,664 100,000
Unitarian	364	62,593	62,593
United Brethren in Christ	2,748	453,480	390,132
	212,190	41,693,104	36,742,985
	834		_
Eastern Orthodox	3,728	686,287	502,730
Old Catholic.	54	4,641,184 10,836	3,341,652 8,634
Polish National Catholic	146	250,000	200,000
Roman Catholic	14,791	23,419,701	17,330,558
Other Bodies	22,019	1,791,557	1,590,622
Totals	253,762	72,492,669	59,717,181
	200,702	· 2,472,009	27,7 17,181
*Continental United States only.			

Church Membership in Europe

Albania.—Albania's 688,280 Moslems comprised twothirds of the population. Orthodox Church members and Roman Catholics totalled 210,313 and 104,184 respectively.

Austria.—Austria's inhabitants were overwhelmingly Catholic. In 1934 Roman Catholics claimed 90.57% of the population; Protestants, 4.38% and Jews, 2.83%.

Belgium.—The population of Belgium was predominantly Catholic. In 1937 there were 6,000 Roman Catholic clergy to 31 Protestant pastors in Belgium. There were two Reformed Churches in the country.

Bulgaria.—In 1934 about 84% of the inhabitants (5,100,000 people) were listed as members of the Orthodox Church, the national faith. Other churchgoers included about 820,000 Moslems, 48,000 Jews, 46,000 Roman Catholics, 23,000 Armenian-Gregorians and 8,700 Protestants.

Czechoslovakia.—The principal confessions, according to the official 1930 census, were: Roman Catholic 10,831,696; Protestant 1,129,758; Czechoslovak Church 793,385; Greek Catholic 585,041; Jewish 356,830; Orthodox 145,598 and Old Catholic 22,712.

Denmark.—The established church of Denmark was Lutheran, but complete religious toleration was extended to every sect. According to 1937 estimates, fewer than 50,000 Danes were non-Lutherans.

Eire.—About 2,730,000 inhabitants (93% of the population) were members of the Roman Catholic Church in 1944. Minority religions, according to 1941 figures, included 145,000 Protestant Episcopalians and 28,000 Presbyterians.

Finland.—The established religion was Lutheran, but complete religious toleration was guaranteed.

France.—The vast majority of the French population was listed as Roman Catholic. The actual number of Roman Catholic churchgoers, as distinct from those born into the Catholic faith, was put at 10,000,000. Protestants and Jews numbered more than 1,000,000 before World War II.

Germany.—The chief religious denominations of Germany in 1933 were: Evangelical 41,080,024; Roman Catholic 12,760,065; Jewish 502,977 and other faiths 2,686,560. Few Germans of Jewish faith survived the nazi slaughters of World War II.

Great Britain and Northern Ireland.—The established Church of England (Protestant Episcopal) claimed a full communicant membership of 2,382,857 as of Easter day, 1936. Presbyterian Churches in 1937 (in Great Britain and Northern Ireland) claimed a membership of about 1,688,000. Methodist members and probationers in Great Britain that year totalled 829,000, while Congregational Churches listed more than 465,000 members. Membership of various Baptist organizations was more than 410,000. The Jewish faith had about 300,000 members. Roman Catholic membership (in England and Wales) was about 2,400,000 in 1937.

In Northern Ireland (1937 figures), Presbyterian churchgoers totalled 390,931; Episcopalians 345,474 and Methodists 55,135; other Protestant sects 59,915. Roman Catholics in Northern Ireland numbered 428,920.

Greece.—The great majority of Greeks belonged to the Greek Orthodox Church. Members of other faiths were (1938 figures): Moslems 126,000; Jews 73,000; Roman Catholics 35,000 and Protestants 9,000.

Hungary.—In Hungary about two-thirds of the post-World War II population were Roman Catholics. The Protestant minority claimed slightly more than one-quarter of the population. There was a considerable Jewish minority in Hungary before World War II.

Italy.—In 1931 it was estimated that 99.6% of all Italians should be regarded as Roman Catholics. However, the growth of the anticlerical leftwing parties after World War II reduced somewhat the over-all following of the Catholic Church in Italy.

Netherlands.—Roman Catholic membership according to the 1930 census was 2,890,022. Membership in the Dutch Reformed Church was 2,732,333. Additional Protestant sects were Old Catholic Church (nonpapal Catholics) and Mennonites (numbering about 60,000). A small Jewish minority resided in the Netherlands before World War II.

Norway.—The state religion was the Evangelical Lutheran. With the exception of Jesuits, other religious bodies continued to be tolerated. The "dissenting" religions totalled 91,459 in 1930, including 12,000 Methodists, 8,000 Baptists and 2,800 Roman Catholics.

Poland.—Approximately 64% (about 22,000,000 people) of Poland's prewar population was Roman Catholic. Prewar estimates of other confessions follows: Greek Catholics 3,500,000; Orthodox Church 3,800,000; Jews between 3,000,000 and 3,500,000 (most of whom were slain by Germans in World War II); Protestants 700,000.

Portugal.—The vast majority of the population was Roman Catholic; Protestants numbered about 5,000.

Rumania.—Before World War II, Rumania's actual and potential churchgoers were distributed as follows: Orthodox Church 13,200,000; Jews 1,500,000; Greek Catholics 1,427,000; Roman Catholics 1,200,000; Reformists 720,000; Lutherans 400,000; Moslems 260,000 and Unitarians 75,000.

Spain.—Catholicism was restored as the state religion after the Civil War (1936–39). The miniscule Protestant minorities were severely repressed by the Franco government.

Sweden.—The majority were members of the Lutheran Church, which was the state religion. Other sects were small in number.

Switzerland.—Members of the Reformed Church in 1930 totalled 2,230,536; Roman Catholics 1,666,317 and Jews 17,973.

Turkey.—The majority of inhabitants were Moslems, although Islam no longer was legalized as the state religion. Other confessions included: Orthodox Church 125,000; Jews 79,000; Roman Catholics 32,000 and Protestants 8,486.

U.S.S.R.—The Orthodox Church, which was disestablished by the Russian revolutionists in 1918, regained official recognition during World War II. The probable number of Orthodox adherents was put at 60,000,000.

Yugoslavia.—The estimated prewar membership of Yugoslav denominations was as follows: Serbian Orthodox Church 6,785,000; Roman Catholics 5,217,000; Greek Catholics 44,600; Protestants 231,000; Moslems 1,561,000 and Jews 63,000. (See also Religion.)

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Church of England

William Temple, archbishop of Canterbury for two and a half years only, enthroned on April 25, 1942, stood out as the guiding spirit of the church during the eventful decade, 1937–46. While he was still archbishop of York his leadership was recognized and followed. After his sudden death (Oct. 26, 1944) the church navigated its course according to the compass bearing he had set.

The years immediately preceding World War II were a time of recovery after parliament's rejection of the proposed new prayer book (1927-28) and the fierce controversy in the church which occasioned it. The number of deacons ordained annually rose to an average of 557. Improvements were noted in the statistics of baptisms, confirmations and Easter communicants. Diocesan contributions to the central church fund steadily increased. In 1939, 38 new churches were consecrated, making a total of 263 to be built during 1930-39, or double the number built during the previous decade. These healthy signs were symptomatic of an active and more hopeful spirit in the church, which the common effort and urgency of war developed and reinforced. Both clergy and people rose to the crisis of war with self-sacrifice that went far to re-establish the waning influence of the church at the centre of national life. Although the losses suffered through air raids in architecture and artistic treasure in

churches were far less than might have been expected, the total cost of restoring or rebuilding 456 cathedrals and churches and repairing a further 3,353 entailed a huge expenditure which government war damage grants only partially relieved. In addition, vast government rehousing schemes necessitated a further huge outlay and the extension of the Reorganization Areas measure (1943) to include new housing as well as bombed areas. Even more serious was the closing down and dislocation of parochial activity through evacuation, conscription and blackout precautions. Above all, the church was crippled by an acute clergy shortage. Parishes already understaffed were called upon to provide chaplains for all three services, despite the shrinkage of ordinands to only 159 in 1945.

Nevertheless, the church rose to the occasion. During World War II, diocesan contributions to the central church fund increased each year from £112,132 in 1939 to the new record of £140,030 in 1945. At the end of the war, before the church considered its own needs, its thank offerings on V-E day were devoted towards the £250,000 promised by the Church of England for Christian reconstruction in Europe, and on V-J day towards a pledged gift of £100,000 to the Anglican daughter church in China.

Discovery of the Church.—In the extremity of its ordeal, the nation discovered the stabilizing inspiration of the church, thronging its cathedrals and churches on great national days of prayer and then of thanksgiving, and investing D-day with the sanctity of a crusade. The people, too, discovered the clergy. At home, parish priests in general stood out as key men in their neighbourhoods. Abroad, millions of fighting men came to know their padres and to recognize their worth. In the three services the number of clergy who served as full-time chaplains was 2,703. Of these, 58 were killed, 72 wounded, 86 became prisoners of war and 388 received decorations. Led by Archbishop Temple, the church discovered itself to the people. In Jan. 1941 the Malvern conference, summoned by Dr. Temple under the auspices of the Industrial Christian fellowship, endorsed the ten foundations of peace put forward in a joint letter to The Times (Dec. 23, 1940) by the leaders of church life in England. The following year Dr. Temple's first act on becoming primate was to conduct a series of meetings in great cities affirming the right and duty of the church to lay down principles which should govern the ordering of society.

Reorganization.—The anxiety of the church to plan for the return of men and women from war service was reflected in an activity, both in convocation and the church assembly, that was astonishing even apart from the extreme difficulty of travel and the loss of the new church house at Westminster, four months after it had been opened by the king in June 1940.

Financial and administrative reforms largely followed a reorganization policy submitted by the bishops to the assembly and diocesan conferences in 1943. The Episcopal Endowments and Stipends measure received the royal assent in 1943, and the Episcopal Pensions measure in 1945. The pensions board increased all pensions from £200 to £250. The ecclesiastical commissioners and Queen Anne's bounty were amalgamated by 1946. The ecclesiastical commissioners, by their K-scheme (1943), which doubled seven-year covenants undertaken by parochial church councils, added (by the end of 1946) £223,000 to the annual income of incumbents, depleted by £475,000 a year through the Tithe act of 1936; and followed this by a more equitable arrangement of curacy grants. As

laymen were reluctant to subscribe the new money required by the rise in cost of living unless there was some modification of the "parson's freehold," the assembly gave much time to the framing of two Incumbents' (Disability and Discipline) measures, after all diocesan conferences had been consulted.

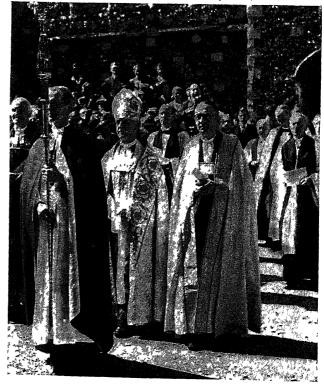
Equally far-reaching were the measures taken for greater pastoral efficiency. The convocations followed up a commission on baptism (which reported in 1940) with another on confirmation which referred its interim report to the consideration of diocesan synods in 1945. In 1945 they approved for experimental use an amended revised lectionary, and in 1946 substituted for canon 99 (1603) a new table of kindred and affinity, in accordance with the findings of a commission which had reported in 1940.

The church assembly set up a Church of England youth council in 1942; reorganized the supervision of church training colleges in 1944; and in 1944 and 1945 considered the proposals of two reports designed to make fuller use of the contribution of women in the service of the church.

Even more important was the entire reorganization of the Central Advisory Council of Training for the Ministry to implement the long-awaited report (1945), Training for the Ministry, and to arrange for the selection and training of service candidates from the 5,000 who desired to be ordained. To meet the latter emergency the archbishop of Canterbury in 1946 asked the dioceses to contribute £600,000 in the next five years.

Occumenical Co-operation.—The patient growth of occumenical co-operation, which Archbishop Temple in his enthronement sermon called "the great new fact of our era," flowered in 1937 with the Oxford conference on church, community and state ("Life and Work") and the Edinburgh conference ("Faith and Order"). The following year the two streams of the same movement were

Dr. Geoffrey Francis Fisher (wearing mitre), the new archbishop of Canterbury and primate of all England, proceeding to Canterbury cathedral for enthronement, April 19, 1945



merged in a single world council of churches, from which Rome alone was absent. As a consequence, the British council of churches was formed in Sept. 1943 with Archbishop Temple as its first president.

The war undoubtedly stimulated occumenical co-operation. Religion and life weeks, on a united front, were held all over the country. In 1944 there took shape the Coventry scheme of an interdenominational centre for religious and social work in close connection with its cathedral, when rebuilt.

Most important of all, on Aug. 15, 1941, Archbishop Cosmo Gordon Lang led a deputation, which included free church leaders, to confer with the minister of education. The "Five Points" they submitted were all implemented in the Education act of 1944, which ordained that henceforth Christian teaching and religious worship should form part of the curriculum of both primary and secondary schools.

According to Archbishop Temple in his enthronement sermon, the rise "almost incidentally" of oecumenical co-operation was "the result of the great missionary enterprise of the last one hundred and fifty years." Naturally, therefore, the scheme for church union in south India, begun in 1919 and blessed by the Lambeth conference of 1930, advanced to a stage that called for pronouncements from the Church of England. Strong controversy ensued and continued despite weighty reassurances tendered in full synod to the convocation of Canterbury by both Archbishop Temple (1943) and Archbishop Geoffrey Fisher (1945).

Evangelism.—In 1938 the commission on Christian doctrine, appointed in 1928, issued its report, Doctrine in the Church of England. While demonstrating the comprehensive character of the church, the report (notably the preface of its chairman, Dr. Temple) vindicated the orthodoxy of its fundamental beliefs. This was significant of a change of mood in the church from a Pelagian preaching of the automatic progress of men towards perfection, to a biblical theology and a demand for a doctrinal basis in matters of faith and practice.

The war deepened this orthodox reaction against the self-regarding humanism of liberal Christianity, as evidenced by the popularity of such champions of dogma as C. S. Lewis and Dorothy Sayers, and the relative failure of religion and life weeks with their new evangelism of a "social gospel."

This explained the remarkable response to the report of the archbishops' commission on evangelism Towards the Conversion of England (1945), which became a "best seller" in every English-speaking country. The report, dedicated to the memory of Archbishop Temple, based its main contention on the distinction he had drawn between christianizing society and making men and women Christians. The report not only stimulated evangelism in every diocese and almost every parish in the land, but (in response to its findings) the assembly set up a commission to overhaul the publicity agencies of the church, and commissioned the bishops to devise some central coordinating council for evangelism.

Deeply significant, too, of the same doctrinal trend was the number and character of the theological works which appeared in wartime, such as the Anglo-Catholic Signpost series and the evangelical St. Paul's Library. Similarly, Dom Gregory Dix's massive The Shape of the Liturgy was symbolic of a kindred liturgical movement which refused to allow the church to debase the glory of its services, despite its anxiety to welcome multitudes ignorant of the Bible. (See also Anglican Communion.)

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Church Reunion

See CHRISTIAN UNITY; RELIGION.

Ciano, Galeazzo

Count Ciano (1903–1944), Italian statesman, was born March 18, 1903, at Leghorn, Italy. After studying law, he entered the diplomatic service. He married Benito Mussolini's daughter, Edda, in 1930; six years later he became foreign minister in his father-in-law's government. Ciano utilized his official position to build up the holdings left him by his father and in 1939 he was reputed to be one of the richest men in Italy, with a fortune estimated at \$60,000,000. His foreign policy was pro-German and it was reported that he swayed Mussolini to join Hitler's side in World War II. This influence was subsequently denied by Edda Ciano.

After successive axis defeats in 1942, Ciano joined up with the fascist faction that wanted to sign a separate peace with the Allies. Reports that Ciano had joined the defeatist "peace" faction led to his removal from the foreign office; in Feb. 1943 he was appointed envoy to the Vatican. Ciano was among those who demanded Mussolini's ouster during the historic grand council session of July 24, 1943.

After the duce's resignation, Ciano fled from Rome, but in Nov. 1943 it was disclosed that he had been captured and jailed in a Verona prison to await trial before a neo-fascist court on charges of high treason. Found guilty of these charges, he was executed Jan. 11, 1944, by a firing squad.

He left a Diary, published after his death.

Cigars and Cigarettes

See Tobacco.

Cincinnati, Society of the

See Societies and Associations.

Cinema Industry

See Motion Pictures.

Cinnamon

See SPICES.

C.I.O. (Congress of Industrial Organizations)

See LABOUR UNIONS: SOCIETIES AND ASSOCIATIONS; STRIKES AND LOCK-OUTS.

Citrine, Baron (Walter McLennan Citrine)

Baron Citrine (1887—), British trades union leader, was born in Liverpool. He began his working career as an electrician, becoming a district secretary of the Electrical Trades union in 1914. Rising in British trades union ranks, he became general secretary of the Trades Union congress in 1926 and two years later (1928) he was named president of the International Federation of Trade Unions. Citrine enjoyed close relationship with the American Federation of Labor, but his recommendation, made Feb. 23, 1943, that U.S. labour join in an alliance with soviet trades unions was flatly rejected by A.F. of L. leaders. At the sessions of the World Trade Union conference in Paris in 1945, Citrine warned that the British unions

would not be "bludgeoned" into any new world organization by a majority vote. On Oct. 6, 1945, the W.T.U.C. elected Citrine president of its executive committee. On the King's Birthday Honours List, June 12, 1946, Sir Walter was created a baron.

Citrus Fruits

See FRUIT.

City and Town Planning

See Town and Regional Planning.

City Government

See MUNICIPAL GOVERNMENT.

City Manager Plan

See MUNICIPAL GOVERNMENT.

Civil Aeronautics Act

See Airports and Flying Fields; Law.

Civil Aeronautics Administration

The Civil Aeronautics administration evolved and expanded greatly during the decade 1937–46, in part as a reflection of the over-all growth of civil aviation itself, and in part as an instrument for achieving such growth. Probably the greatest single contribution by the CAA to that growth was the Civilian Pilot Training program of 1939–44 (known during its last two years as the War Training service). Under this program the CAA supervised the training by contracting schools of more than 400,000 pilots, the overwhelming majority of whom went on to the army and navy for further training and service.

Another activity of considerable significance to both war and post-war aviation was the Defense Landing Area program. At a cost of \$364,000,000 the CAA built—again through contractors—534 airports, most of them large, for the immediate purposes of the army and navy, but with eventual civil use in mind. After World War II, many of these airports were utilized in civil flying under municipal control, making it possible for the new Federal Aid Airport program to emphasize small fields.

This airport program was presented to congress in the fall of 1944, as the National Airport plan, and enabling legislation (public law 377) was signed by President Truman in May 1946.

The Federal Airways system established, maintained and operated by CAA grew in size from 22,000 mi. to 37,000 mi. of lighted routes, and many new and improved types of air navigation facilities were introduced. Perhaps the two outstanding of the latter were the very high frequency omni-directional radio range, offering the flyer virtually static-free guidance over 120 courses instead of 4, and the instrument landing system, built for installation at 105 airports after many years of development and testing by CAA. The CAA-ILS mobile unit used by the army during World War II under the designation SCS-51, made possible landings in conditions of almost zero visibility, by virtue of a "localizer" signal down the centre of the runway, a "glide path" beam at a 21/2° angle from the runway, and radio marker beacons indicating distance from the "touchdown" point.

The first of 16 foreign offices were established as part of a program to regulate and promote international activities of U.S. civil aviation. At home, the CAA appointed special assistants in each region to stimulate the development of personal flying, and for the same purpose many regula-

tions were liberalized and their administration decentralized or delegated to appointees in the industry.

In terms of organization, the CAA began the decade as the bureau of air commerce in the department of commerce; during the years 1938—40 was a part of the independent Civil Aeronautics authority; and after 1940 operated as the Civil Aeronautics administration, a bureau of the department of commerce. (See also Airports and Flying Fields; Aviation, Civil; Aviation, Military.)

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Civil Affairs (Military Government)

See Allied Military Government.

Civil Air Patrol

See AVIATION, CIVIL.

Civil Aviation Organization, Provisional International

See International Organizations; United Nations.

Civilian Conservation Corps

When the Civilian Conservation corps was established in the United States in the spring of 1933, it was an experiment in unemployment relief never before attempted anywhere in the world. It was also a revolutionary policy on the part of the U.S. government to save its natural resources of forest lands and top soil on agricultural lands.

On June 30, 1942, when by congressional action, the corps ceased operations and began to dispose of its assets, it had completed nine and one-quarter years of operation.

Its first object was to conserve the nation's greatest asset—its youth—idle and depressed, unable to secure jobs in the depression years. Its second object was to conserve the nation's other great heritage—its forests and its soil.

In the first few months of its existence, CCC work was mostly hand labour with pick and shovel. It immediately became apparent, however, that to replant cut-over forests, control soil erosion, anchor whole water sheds, fight forest fires and floods, heavy equipment was needed. Eventually, 40,000 vehicles, trucks, tractors, bulldozers and power shovels became tools of the corps.

CCC workers planted 2,356,000,000 trees; constructed 126,000 mi. of roads and built 100,000 mi. of telephone lines, through national forests. They expended 6,660,000 man-days fighting forest fires. They built 6,660,000 small check dams to control soil erosion. They built hundreds of state parks with cabins, artificial lakes, water supply systems, etc. They built water tanks for cattle on western plains, fire lookout towers in forests, air and parachute training fields for the army, and did countless other jobs too numerous to mention here.

During the years of the corps' operation Congress appropriated \$3,181,918,515, of which more than \$200,000,000 was returned to the treasury, making the total cost of the corps' operation \$2,968,690,658. Of this amount, \$662,895,000 was sent to dependents of enrollees taken from their base pay of \$30 per month. In most states, the \$25 per month of enrollee pay sent to his family was deducted from the family relief payments if the boy's family was on relief.

A careful inventory of the work accomplishments of the CCC showed that in a material way alone the return received by the federal government and the states was much

in excess of the dollar cost of its operation, to say nothing of the benefits received by the enrollee himself in education, work training and character. None of the work of the CCC was "made" work; it was necessary conservation work.

In the final report to congress by the director of the Civilian Conservation corps, he pointed out that there was still a vast amount of vital and necessary conservation work to be done to bring back grass to the grazing areas of the west that had been overgrazed for the preceding 25 years; to carry on a tree-planting program on the cut-over and burned-over areas in the country; to do necessary work in soil erosion control. The actual work program would employ 6,000,000 men for four years, according to the director's estimate.

Three million young men passed through the corps. The needs of the armed forces made necessary the closing of the program.

(J. J. McE.)

Civilian Defense

See AIR RAID DEFENSE; WAR AND DEFENSE AGENCIES.

Civilian Production Administration

See WAR AND DEFENSE AGENCIES.

Civil Liberties

Citizens' liberties associated with democratic governments rest on the principle of the sovereignty of the voting population with control by the majority, and without impairment of the liberties of minorities to carry on their activities. Essential to such a system of majority control and minority rights are freedom of speech, press, assembly, organization, equality before the law regardless of race, religion or belief, and protection under the criminal law by resort to the writ of habeas corpus and by guarantees of fair and speedy public trials. Civil liberties demand protection of citizens not only from oppressive acts of government but of private agencies and individuals as well.

The phrase and the concept, originating in western Europe and the United States in the almost synchronous emergence of capitalism, republicanism, the nation-state and Protestantism, spread over large parts of the world to express the natural desires of all peoples for freedom to control their governments, to form their associations and to carry on propaganda for any ends, political, economic or social. But they were blocked by traditionally autocratic governments, by the rise of fascist states, and in all of the dependent colonial countries, mandated areas and islands by alien imperialist controls.

Civil liberties existed in 1937 in strength complete enough to be reasonably effective guarantees only in 26 of the 75 sovereign states of the world—about a third: (Great Britain, Ireland, Australia, Canada, New Zealand, the United States, France, the Scandinavian countries, the Baltic states, Switzerland, Finland, Austria, Czechoslovakia, Iceland, Mexico, Belgium, the Netherlands, Chile, Costa Rica, Colombia and Uruguay).

Countries with a degree of these liberties not sufficient to be controlling totalled about 14: the Union of South Africa (for whites only), Poland, Hungary, Greece, Bulgaria, Egypt, Argentina, the Central American republics, Cuba and Venezuela.

Absolute dictatorships, denying the substance of such liberties marked 14 countries: (the soviet union, Japan, China, Siam, Italy, Germany, Spain, Albania, Turkey, Brazil, Haiti, Santo Domingo, Portugal and Peru). The rest of the 75 sovereign states inclined toward the absolutism of the one-party dictatorships. The colonial, man-

dated countries and islands varied in the degrees of freedom accorded the natives by the ruling power, but final authority was always alien and arbitrary.

Gauged by population in 1937, less than one-fourth of the world's people lived in countries enjoying the advantages of democratic liberties; almost one-half in sovereign dictatorships or quasi-dictatorships; and more than a fourth in colonial countries. In two countries—Spain and China—war, enemy of all civil liberties, was raging.

The forces of the time were all hostile to the extension of the democratic principle. The rise of fascism, the preparations for war, the growth of economic nationalism all circumscribed democratic processes. The fear of the spread of communism had prompted many countries to outlaw the Communist party. The stirrings of revolt among many colonial peoples were met with drastic repression. The threatening expansionist power of Germany. Japan and Italy found responses in many lands where the fascist system seemed an answer to the fear of the rise of labour and the Left. The victory of fascist forces in the Spanish civil war found an echo in the Spanish-speaking countries of the new world, where similar reactionary movements gained headway.

The appeasement of fascism, which marked the democratic states almost up to the out-break of World War II, led to restraints on anti-fascist forces in those countries, particularly marked by interference with the supporters of the Loyalist Spanish government. Democratic liberties were at low ebb even in many countries which most stoutly professed them.

The nazi-soviet pact of 1939 and the war which immediately broke out with Germany's eastern frontier thus secured, resulted in further restrictions on the liberties of Communists who opposed the war as imperialistic, since Russia was not involved. With the attack on Russia in 1941, the Communists at once became the militant supporters of the war and champions of democracy, with consequent relief from restrictions.

Military authority, always hostile to civil rights, became supreme in many areas and activities. Conscription was universally applied, and in England included women. Martial law prevailed, of course, in active military areas, and in the United States was even extended to Hawaii, where the U.S. supreme court later held it to be unlawfully applied.

Conspicuous among the war measures justified on grounds of security, which raised questions of violations of civil liberty were: (1) in the United States, the evacuation from the Pacific coast and detention in camps of the entire population of Japanese blood; (2) in South America the transfer to the United States for internment of more than 5,000 axis aliens—German, Italian and Japanese; and (3) in England the internment without public trial of hundred, of British citizens associated with the British union of fascists.

Restraints on Jehovah's Witnesses because of their antiwar religious doctrines and refusal of military service marked many countries where they were imprisoned by the thousands and where their organization was in some countries outlawed. In other countries the distribution of their literature was banned, and their representatives were barred from international travel.

War censorship of cables and radio was charged in many countries with going far beyond the needs of military security, though not nearly to the extent of World War I.

Despite the necessary suppression of dissent during the

war and the many autocratic measures held to be essential to military security, the goals of the war were formulated in the most advanced terms of democratic faith. The "Four Freedoms" (q.v.) voiced by President F. D. Roosevelt as the aims of the United States before its participation in the war were accepted universally by the anti-fascist nations. The first two of the freedoms were a restatement as slogans of the principles of civil liberty-freedom of speech and press everywhere in the world, and freedom of religion. The other two, freedom from want and freedom from fear, carried the implications of meeting human economic needs and of averting wars-obviously the necessary conditions for extending civil liberties. President Roosevelt's concepts for the United States were further elaborated in the Atlantic charter, voiced by him and Prime Minister Winston Churchill, and later embodied in declarations signed by leaders of all the Allied nations. Thus the greatest of all wars became officially a war for democratic liberties and the extension to the entire world of the concepts marking the western politically democratic world.

The goals thus formulated had a profound effect on the peoples of the western countries, who made them their own. The gulf between professions and practices was quickly pointed out by the subject colonial peoples and the darker races. In the United States the Negro minority conducted a militant and bitter campaign for recognization of their rights as citizens in a war for democracy which they proposed to win also at home. For the first time the federal government, in response to Negro pressure, established a fair employment practices committee to secure work without racial discrimination. The racial oriental exclusion act was repealed as it affected the Chinese ally, and after the war the repeal was extended to East Indians and Filipinos. Discriminatory practices in the armed forces were somewhat modified by opening all branches to all races, the last being the opening of navy service to Japanese-Americans after the war. In India, Indonesia and Indo-China, Burma and elsewhere in the subject colonial countries, nationalist movements took on added strength even under the Japanese occupation. In all these movements the spirit of civil liberty embodied in the Four Freedoms and the Atlantic charter (though repudiated by Prime Minister Churchill as to the empire) animated the resistance. It affected, too, the resistance movements in the occupied countries of Europe, just as it stirred the masses of the people everywhere.

When the Allied nations met at San Francisco, Calif., in April 1945 to draft a charter for the organization of peace, the principles of civil liberty found a ready reception. For the first time in history, guarantees of racial equality, self-government for dependent peoples, democratic liberties, human rights were all spelled out in a basic document.

But it became evident even before the conclusion of the war in 1945 that one of the Allied nations, the U.S.S.R., entertained quite contrary concepts of democratic liberties. Civil liberties in the accepted western sense seemed to the soviet union mere political rights without substance in the economic and social spheres, concealing the dictatorship of capitalism and imperialism. To the soviet union, democracy meant the abolition of private ownership of land and industry, and government in the interests of producers and consumers, not property-owners. Under such a government, since the interest of the governing party and the people were one, civil liberties were unimportant—a conception largely negated by the vast powers of the secret political police in suppressing dissent and by the all-per-

vasive censorship of radio, press and travel.

The conflict thus emerging from the war marked the debates of the United Nations, the conduct of the joint control commissions in occupied countries, the conferences to draft peace treaties, and the liberated countries to which the Allied governments made guarantees of democratic rights. The concept of civil liberties only for supporters of the soviet view and the corresponding communist policies in any country ran into a head-on collision with the traditional guarantees for all people regardless of view. The soviet and communist view would outlaw "fascists," reactionaries, race-baiters and others from the protections of civil liberties; and the formulation was commonly extended to encompass "all those who are not with us."

The soviet emphasis in world councils was on those aspects of civil liberties where the western world was weakest—racial equality before the law, protection of minority peoples, colonial independence and the greater role of organized labour. No concessions were made to breaking down the isolation of the soviet union or countries in its sphere of influence by permitting free access to journalists, motion picture news reel representatives, travellers or by adopting facilities for international radio transmission.

Despite this impasse in internation councils, civil liberties made advances after the war even beyond their state in 1937. By the end of 1946, the colonial countries had undergone a conspicuous change in the spirit and accomplishment of self-government; four had won their formal independence and had embarked on what appeared to be a democratic road with varying degrees of civil liberty-India, the Philippines, Indo-China (portions of it) and Indonesia (Java and Sumatra). International trusteeships with the promise of civil liberties appeared to be the system in the making for many dependent peoples. International agencies tying together popular movements all over the world grew apace and were encouraged by United Nations provisions for formal co-operation with nongovernmental agencies. Movements for conventions to promote freedom of the press, radio, travel and motion pictures on a world scale took on unprecedented vigour.

The growth of nationalization of industry in many European countries after World War II was challenged as hostile to the interests of democratic liberties on the theory that the more government the less liberty—a theory not apparently borne out in fact by the practices of Social Democratic and Coalition governments.

In most countries which had already firmly established the practice of civil liberties, they were extended after the war on stronger foundations, both practically and legally. That fact was attributable in most of these countries to the greater strength of organized labour and of the political parties of the Left with a democratic program.

In actual count as compared with 1937, it appeared at the end of 1946 that somewhat more than a third rather than a fourth of the world's peoples lived under governments with effective guarantees of civil liberty. Added to those listed for 1937 were the colonies on their way to independence and the occupied countries of Germany, Italy and Japan, where civil liberties were more or less successfully established in principle if not wholly in fact. No countries with effective civil liberties in 1937 lost them, save for the Baltic republics incorporated in the soviet union. The lip-service paid to the principles of civil liberty and democracy even in the dictatorships, despite contrary applications and interpretations, promised that the direction of the world's development would be toward the extension of a system still in its early stages of growth, which would appear by its history alone capable of estab-

lishing both stability in the solution of conflict and adequate freedom of opinion and action for individuals and groups alike.

(See also Aliens; Anti-Semitism; Birth Control; Censorship; Communism; Education; Fascism; Four Freedoms; Ku Klux Klan; Law; Lynching; Motion Pictures; Negroes (American); Newspapers and Magazines; Radio.)

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Great Britain.-The highwater mark of civil liberty in Great Britain was probably the period 1870-1914. The aftermath of World War I and the preparation for World War II produced in parliament, in administration and in the courts less regard for liberty, although it was still spoken of politely. The period under review opened with the Public Order act, 1936, passed ostensibly to deal with Sir Oswald Mosley and his supporters. The prohibition of uniforms and control of processions effected by this act were all to the good, although the ban on non-fascist processions imposed by the authorities afterward was surprising. The dangerous clause in the act was that providing for a substantial fine or imprisonment for insulting words or behaviour in a public place likely to cause a breach of the peace. This was first used against miners on strike in Nottinghamshire. The conduct of the police in the same period gave rise to much disquiet. In London particularly some of them showed partiality to fascists and used unnecessary brutality when dealing with demonstrators and anti-fascist meetings.

With the Emergency Powers (Defense) act of Sept. 1939 and the two amending acts of 1940, the government assumed legislative powers with the exception that they might not provide for trial of civilians by court martial. Numerous regulations restrictive of liberty were made, including regulations against disaffection, words causing alarm or despondency and powers of censorship, one of which was invoked to suppress the Daily Worker for a time. The most famous was perhaps 18B, which in effect suspended the right of habeas corpus and gave the authorities unlimited power to detain anyone to whom they objected. During the invasion scare of 1940 a number of people were detained under this regulation, apparently without justification, since they were soon released. The detainees who remained until the end of the war were those associated with the fascist movement. A number of actions to test the legality of 18B came before the courts, but only one or two judges remembered that even in time of war a law is supposed to be construed favourably to liberty. In the famous case in the house of lords of Liversidge v. Anderson, Lord Atkin said that he had listened to arguments which might have been addressed acceptably to the court of king's bench in the time of Charles I.

Both home secretaries, Sir John Anderson and Herbert Morrison, in the face of far greater dangers, used their general powers of repression in a more enlightened manner than had their predecessors of the years 1914–18. Morrison bravely stood up to national hysteria when in 1944 he released Sir Oswald Mosley, who was no longer considered to be dangerous. Another example of tolerance was the treatment of conscientious objectors to military service. Out of 61,000 objectors (including 1,074 women who appeared before tribunals) 3,203 received unconditional exemption, 30,399 conditional exemption for civil

work, and 15,701 were allowed noncombatant duties only. The Emergency Powers (Defense) act expired at the end of Feb. 1946, but some provisions were temporarily continued by the Supplies and Services (Transitional Powers) act, 1945, and the Emergency Law (Transitional Provisions) act, 1946. Apart from the restrictions on changing employment, the only important regulation left was 39A on disaffection.

The effect of World War I was to diminish the regard for liberty, but this was probably not true of World War II. It showed once again that war and civil liberty are incompatible and perhaps produced in western minds a resolve to maintain their civil liberty by increasing and securing economic freedom.

(R. S. W. P.)

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Civil List, British

On the accession to the throne of King George VI in Dec. 1936, a new civil list became necessary and this was made up as follows: his majesty's privy purse, £110,000; household salaries and retired allowances £134,000; expenses of the household, £152,800; royal bounty, £13,200; total, £410,000. This total was the same as that for King Edward VIII had he married while on the throne. As he was unmarried, it was reduced by £40,000.

Net revenues of the duchy of Cornwall, vested in the king till the birth of a duke of Cornwall, amounted to £117,604. After the deduction of sums equal to the proposed annuity for Princess Elizabeth and the additional annuity of £10,000 paid to the duke of Gloucester, the balance was made available by the king's desire for the reduction of the amount payable from the consolidated fund of the civil list.

Amounts payable to individual members of the royal family were as follows: Queen Mary, £70,000; Princess Elizabeth, £6,000; Princess Margaret Rose, £6,000; duke of Gloucester, £35,000; Princess Royal, £6,000. If widowed, Queen Elizabeth would receive an annuity of £70,000, and the list allowed for an additional amount of £9,000 to Princess Elizabeth on her reaching the age of 21 on April 21, 1947, provided no duke of Cornwall had been born.

The Civil List Pensions act, 1937, raised the amount granted in any one year from £1,200 to £2,500, with the effect of increasing the total amount disbursed annually from £23,000 to about £50,000. Space does not permit inclusion of the complete list of pensions granted after 1937, but among them were the following granted for various services to scholarship and culture: 1937, £130 to Dr. Maurice Copis Arrow; 1938, £210 to the three children of James Leslie Starkey; 1938, £160 to Rutland Boughton; 1939, £110 to John Hassall; 1939, £200 to Commander J. R. F. Wild; 1940, £170 to Julius Olsson, R.A.; 1940, £170 to Richard Sickert; 1941, £140 to Frederick Britten Austin; 1941, £120 to the widow of W. H. Davies; 1943, pensions ranging from £120 to £200 were granted to Conal O'Riordan, E. A. Jones, A. R. Hayward, Miss Mary P. Willcocks and the Rev. Robert Elvet Lewis. The minimum pension granted remained f_{100} .

Civil Service

Viewed in retrospect, the ten years ending in 1946 spanned a decade of extraordinary development in civil

service and government personnel administration in the United States. To give this era of progress its proper perspective, the fact should be mentioned that the civil service reform movement in government was more than 60 years old when the period opened. The foundation of a civil service system had first been laid in the federal government in 1883 with passage of the Pendleton act. The same year New York became the first state to enact a similar law, but during the ensuing 50 years progress in the direction of civil service reform in other states and municipalities was sporadic. By the late '30s, 8 additional states had enacted civil service statutes, and similar legislation was found in approximately 650 municipalities.

The years 1937–46 marked a sharp acceleration in this trend. Within that relatively short interval, 14 additional states adopted civil service legislation, and the number of municipalities having such laws reached 1,200 or more. In a few instances, negligible in comparison with the total, civil service laws were repealed, and in some localities where laws were technically in effect, various devices were employed to nullify them. But these instances were exceptional and in marked contrast with the general citizen interest in the improvement of its public service. A nationwide poll of popular sentiment regarding civil service, conducted by the American Institute of Public Opinion in 1936, disclosed that 88% of those polled favoured it.

Many factors contributed to this decade of civil service growth, but no one factor, standing alone, accounted tor it. Popular demand for economy and efficiency in government, born of the depression years, furnished much of the momentum. Steady campaigning on the part of the National Civil Service league gave direction to the movement, and the efforts of this organization were abetted by several other national and local civic groups, including the League of Woman Voters and the U.S. junior chamber of commerce. Two significant studies in the field of governmental administration gave added impetus to the movement. These were the reports issued by the Commission of Inquiry on Public Service Personnel and by the president's Committee on Administrative Management. The first of these dealt broadly with the matter of improving the quality of the public service at all levels of government. Its findings and recommendations. first published as a series of monographs in 1935, exerted considerable influence on the developments of the next several years. The report of the president's Committee on Administrative Management, in dealing with the manysided matters of federal administration, gave major emphasis to needed improvements in federal personnel machinery in its report published in 1937.

Federal Developments.—An outgrowth of this study of federal management methods was a series of executive orders by President F. D. Roosevelt. One, issued in June 1938 extended the federal civil service system to more than 100,000 positions not previously covered. The same order also strengthened personnel administration in the numerous federal departments, and called for establishment of departmental personnel officers. The Federal Council of Personnel Administration, a group of personnel officials which had hitherto played only a minor role in the coordination of personnel policies, was given new stature and responsibilities.

During the next several years, a considerable amount of congressional legislation contributed further to the expansion and improvement of the federal civil service. Among such statutes were several sponsored by Congress man Robert Ramspeck of Georgia and Senator James Mead of New York, broadening the scope of coverage of the civil service law; and an act sponsored by Senator Carl Hatch of New Mexico, banning political activity by federal employees. In 1945, and again in 1946, Senator Sheridan Downey of California sponsored measures resulting in substantial increases in the pay of federal workers. A measure urged by Senator Kenneth McKellar of Tennessee in 1943 threatened to inject partisan politics into top-level civil service appointments. Senator McKellar's proposal, requiring senate confirmation of all appointees to federal positions paying \$4,500 or more, was defeated only after sharp debate.

World War II, which brought unprecedented expansion to the federal service, carried with it greatly increased attention to personnel administration. Recruiting to meet the demands of mushrooming federal war agencies was an incessant problem for the U.S. civil service commission, despite its greatly augmented staff and the active participation of the departments themselves. The problem was further aggravated by abnormally high employee turnover, Numerous devices were used to attack the problem. Federal employees were "frozen" in their jobs; the work week was extended, accompanied by liberal overtime premium pay; and extensive programs of employee counselling were initiated to build morale and minimize unrest.

With the return to peace and its accompanying disbandment of the federal civilian army, major changes were made in the basic pattern of the federal civil service system. Competitive examinations were resumed, and an executive order issued by President Truman early in 1946 laid the foundation for a long-range program to decentralize several of the civil service commission's functions. At the same time, the president's order sought to give to the several federal departments a much greater degree of responsibility than before for the operation of their own personnel programs.

State and Local Government.—During the decade, 12 states adopted civil service laws covering all or most of their state employees. These were Alabama, Connecticut, Indiana, Kansas, Louisiana, Maine, Michigan, Minnesota, Oregon, Rhode Island, Tennessee and Virginia. In Missouri and Nebraska civil service laws were adopted covering limited portions of the state service, and in Georgia a new constitution adopted in 1946 called for the subsequent enactment of a state civil service law.

A provision in the Social Security act which became effective in 1936 required the establishment of civil service merit systems for the personnel of state agencies taking part in administration of the federal security program. As a result, in those states where employees were not already under civil service, so-called "merit system councils" were established for state departments administering welfare, health, unemployment compensation, employment service and other related activities. During the four years 1937–41, more than 40 of these merit system councils were established in the various states.

A New York state supreme court decision concerning applicability of civil service provisions in the state constitution to county and city employees led to widespread establishment of civil service programs in various municipalities in the state. Elsewhere throughout the country, several of the larger cities and counties also adopted civil service legislation. Among the cities doing so were Louisville, Ky., New Orleans, La., and St. Louis, Mo. Counties adopting civil service programs included Jefferson and Mobile counties, Ala.; Sacramento county, Calif.; Fulton county, Ga.; Ramsay county, Minn.; and Wayne county,

Mich. In Los Angeles, Calif., and Kansas City, Mo., sweeping civic reforms included the reorganization of civil service agencies previously in disrepute.

U.S. Wartime Developments.—The impact of World War II was felt with full force in federal, state and local governments throughout the country. Civil service agencies everywhere adopted new policies and methods to assist in maintaining essential government services in the face of critical manpower shortages. Women were recruited in large numbers to fill gaps left by the drafting of men; restrictions regarding residence and age were discarded, and handicapped persons no longer found their handicaps a barrier to employment. For the most part, employees entering the public service during the war were hired as temporary workers—so-called "war duration" employees.

In the federal government, with its host of new war agencies, the number of employees expanded to three times the prewar level. In 1939, the year before the nation embarked on its all-out rearmament program, there were slightly less than 1,000,000 federal employees. When war broke out, the total had passed 1,500,000, and within a year it had increased by another million. The great bulk of these new employees were in the war and navy departments, which together employed more than half of all federal employees.

The peak level of federal wartime employment was reached in March 1945, when the United States civil service commission reported a total of 2,920,410 employees in the executive branch of the government. Even before the coming of peace, however, a sharp reverse trend set in. From the high point in the spring of 1945 to the end of 1946, approximately 700,000 federal employees were laid off, and the decline had not yet stopped. The reduction in personnel was hastened by congressional action in 1946, under which gradually decreasing employment "ceilings" were placed on the various federal departments.

In sharp contrast with the marked wartime expansion in the federal civil service, state and municipal public employment declined perceptibly. Draft calls and the lure of high pay in war plants combined to reduce the number of city employees in some municipalities by as much as 15%. Fire and police departments were particularly hard hit, as were many publicly-operated utilities. With the end of the war, many states and municipalities faced the dual task of building up their depleted personnel with new recruits, while at the same time substandard war duration employees were weeded out.

General Trends.—Aside from the unprecedented increase in the number of civil service agencies established during the decade, a number of significant trends emerged during that period. Among these were the rise and growth of public employee unions, a material increase in the number of public employees covered by retirement systems and a considerable volume of legislation giving preference in public employment to war veterans. The latter development, related directly to the war and its aftermath, represented a vigorous revival of a trend that had already reached sizable proportion following the end of World War I.

In addition to the several federal employee unions already in existence, two new national unions of state and local public employees were established. The American Federation of State, County and Municipal Employees, affiliated with the American Federation of Labor, had been founded in 1936. A year later, the United Federal Workers of America and the State, County and Municipal Workers of America, both affiliated with the

Congress of Industrial Organizations, had their origin. The two C.I.O. unions later merged, and became the United Public Workers of America in 1946. Although accurate figures on the proportion of public employees belonging to unions were not obtainable, the ten-year trend was unmistakably in the direction of increased unionization. By 1946, more than half of all U.S. cities of more than 10,000 population had one or more organizations of employees. In addition to local units of the national unions, there was also a substantial number of independent state and local government employee organizations.

Strikes of public employees were relatively few compared with those in private industry, particularly during the war years. At the same time, there was a considerable amount of dissension over the proper scope of unionization in the public service, centring chiefly about the issues of collective bargaining, the closed shop and the right to strike. On this last point, congressional opposition found expression in 1946 in a mandate requiring all federal employees to sign a pledge not to strike against the federal government.

The fact that public employees were excluded from coverage under the Social Security act furnished strong impetus to the establishment of numerous state and local public employee retirement systems during the decade. Systems established during this period exceeded by a substantial margin the total number that had been established up to that time. A notable feature of the trend was a tendency toward setting up state-wide co-operative retirement systems in which municipalities within the state could join. Among states in which such systems were established were Illinois, Michigan, Oregon, Pennsylvania and Wisconsin. Outside the federal service, public employees groups who were most extensively covered by retirement systems were school teachers, firemen and policemen; those with the least degree of retirement protection were, in general, workers in the smaller municipalities.

Veterans' preference legislation, a logical by-product of the war, grew in volume as the war drew to a close. In the federal civil service, the Starnes-Scrugham act gave statutory sanction to preference policies already contained in the rules of the U.S. civil service commission, and at the same time extended such preference in several new directions. Similar measures were adopted in many state and local governments for the first time; in others, existing legislation was amended to increase its scope. Veterans' preference provisions were written into the state constitution of several states, including Colorado, Georgia and New York. By the end of 1946, the trend had progressed to the extent that only a handful of governmental jurisdictions remained in which no veterans' preference provisions were found.

Aside from these surface trends which the decade produced, there were also a number of undercurrents in civil service administration related to the general direction of the public administration movement of the period. Perceptibly less emphasis was placed on the policing features of civil service laws, and more effort was directed toward rendering positive assistance to public officials in improving the calibre of public personnel administration. This shift in emphasis was reflected in increased use of scientific methods of personnel management, including job classification and pay plans, improved selection methods, employee training and the strengthening of employee morale. The Civil Service Assembly of the United States and Canada, an organization of public personnel agencies founded

shortly after 1900, sprang to life again after dwindling almost to the vanishing point. The revival of this organization and the broadened scope of its activities contributed substantially toward the improvement of personnel administration in the public service during the decade.

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Great Britain.—The civil service in 1937 (apart from industrial work people) numbered some 350,000 persons, employed in more than 80 departments. Many departments at that time had begun to feel the pressure of work caused by the rearmament program and the threat of war, and by 1939 the numbers had risen to 400,000. Nevertheless, the general scope and organization of the civil service in 1939 had not greatly changed since 1920.

World War II brought many new duties to nearly all departments. Ten new departments were set up, some for war tasks, others, at a later date, to prepare for reconstruction. The service rose to a peak figure in 1943 of

730,000, and at the end of 1946 stood at a figure of 720,000.

To meet this great increase in duties and to replace permanent civil servants called up for military service, men and women were brought into temporary government service during the war from many walks of life, commerce and industry, the professions, the universities and scientific research. The whole decade, and particularly the war years, was a period of intense and sustained effort for the service.

A number of departments created during the war were made permanent, and the legislative program of the Labour government which took office in 1945 added permanently to the duties of the civil service. Moreover, the functions of government had broadened in scope, and involved much closer contact with the life of the community at many points.

Permanent recruitment was suspended during World War II. In 1946, a major program of recruitment was started, to make good arrears, to replace temporary civil servants gradually returning to their normal occupations and to provide for permanent expansion. A series of competitions was to be held over a period of about three years, the main principle being to afford opportunities to those who might have competed but for the war. Opportunities also were offered to the best qualified of the wartime recruits to stay on a permanent footing. Those retained permanently included some who had been appointed to the highest ranks in the service.

Steps were taken to adapt the service to changing postwar conditions. Thus, greater stress was placed in recruitment to the higher grades on personal qualities which could be tested by interview rather than by written examination. Much more was done to train civil servants for their duties after entry to the service. Greater use was made of special skills—the scientists, economists, statisticians and technicians of all kinds were enabled to increase their contribution to the work of government; and greater attention was given to methods of work and to problems of organization. BIBLIOGRAPHY.—R. W. Rawlings, Civil Service and the People (1945); C. L. White, Modern Guide to the Civil Service (1945).

(E. E. Bs)

Civil War in Spain

See Spanish Civil War.

Clark, Mark Wayne

Clark (1896—), U.S. army officer, was born May 1, 1896, at Madison Barrack, N.Y., where his father, Col. Charles C. Clark, was then stationed. He was graduated from the U.S. military academy at West Point (1917) and was wounded in action on the western front in June 1918. He was a graduate of the Command and General Staff school (1935) and the Army War college (1937).

Clark arrived in England in July 1942 to assume command of U.S. army ground forces in the European theatre. In Nov. 1942 he was in command of U.S. forces that participated in the Allied landings in North Africa. Three weeks earlier, Clark headed a group of U.S. officers that had secretly landed in North Africa and obtained an agreement for assistance from French officers friendly to the Allied cause.

For this mission, he was awarded the congressional medal of honour and was promoted to the rank of lieutenant general.

Gen. Clark was in command of the Allied 5th army that invaded Italy in Sept. 1943 and in Nov. 1944, he succeeded Field Marshal Alexander as commander of the Allied 15th army group in Italy. He was appointed, March 13, 1945, to the temporary rank of a full general. The following month, he launched the final assault against German troops in Italy.

On May 2 the German forces in northern Italy and in some sections of Austria laid down their arms to Clark's armies.

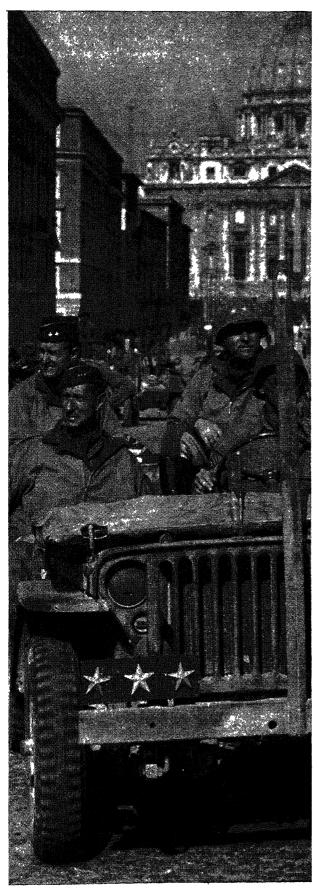
He was then named (June 28) commander of U.S. occupation forces for Austria.

In early 1946, a group of former officers of the 36th division that fought in Italy under Clark asked the senate Military Affairs committee not to approve his promotion to the permanent rank of major general; they charged that his "blunders" caused needless bloodshed in the Rapido river crossing in Italy. The war department in reply asserted that Clark had exercised "sound judgment" in planning and ordering the crossing on June 20; his promotion was confirmed.

Clark, Thomas Campbell

Clark (1899-), U.S. lawyer and attorney general, was born Sept. 23, 1899, in Dallas, Tex. He received his law degree from the University of Texas (1921), and was civil district attorney of Dallas county, 1927-32; in 1937, he was appointed special assistant to the U.S. attorney general. The following year he was shifted to the department's antitrust division. Later, he was named coordinator of alien enemy control in the Western Defense command and was, in May 1942, made head of the War Frauds unit in the antitrust division, the department of justice. Made assistant attorney general of the antitrust division in March 1943, he waged active warfare against cartels which he characterized as "private economic super-governments," and the following August he was appointed head of the justice department's criminal division with authority extending to the War Frauds

President Truman named Clark to succeed Francis Biddle as U.S. attorney general, May 23, 1945. Clark, who assumed office June 30, ordered prompt prosecution of



Lt. Gen. Mark W. Clark passing St. Peter's in his jeep after the Allied capture of Rome, June 4, 1944. He was accompanied by Major Generals Alfred M. Gruenther and Geoffrey Keyes

black market cases and instituted a drive to round up income tax evaders. On Sept. 17, 1945, he recommended that congress act to reorganize and subdivide the Aluminum Company of America. He lifted wartime curbs on enemy aliens on Jan. 7, 1946.

Clay, Lucius DuBignon

Clay (1897-), U.S. army officer, was born April 23, 1897, in Marietta, Ga. A graduate of the U.S. military academy (1918), he was an instructor at an officers' training school during World War I. He also graduated from the engineering school in 1920 and was associated with a number of army construction and engineering projects in the interlude between the two world wars. In March 1942, he was made deputy chief of staff for requirements and resources in the Army Service of Supply and was promoted to temporary rank of major general (Dec. 1942). As the war drew to a close, he opposed implementation of reconversion plans on the ground that the army had to keep its military supplies at peak requirements until the Germans finally surrendered. In Dec. 1944 he was transferred to the Office of War Mobilization and Reconversion as deputy director for war programs and administration.

On March 29, 1945, Clay was appointed deputy to Gen. Eisenhower in charge of civil affairs in occupied Germany; he also was named a lieutenant general the following month. In addition, Clay headed the U.S. section of the Allied Control council for Germany and was deputy military governor of the U.S. zone of occupation.

Clays

A comparison of clay production in the United States over a period of years was handicapped by changes in the method of collecting statistics which made the figures not strictly comparable. The accompanying table shows the outputs of the major types of clays, with the amounts going into the chief uses.

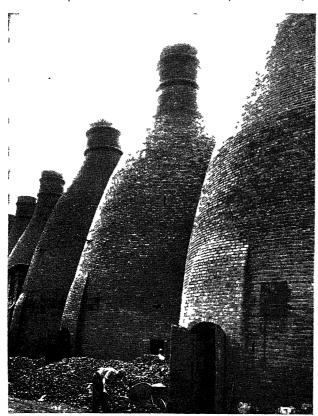
Salient Statistics of the U.S. Clay Industry

	(Tho	usands of sho	rt tons)		
	1937	1939	1941	1943	1945
Kaolin	7323	780.8	1,087.8	929.4	940.0
	426.2	463.0	605.1	545.2	550.4
	86.0	90.3	127.1	51.0	109.9
	77.2	57.4	123.5	147.7	90.7
	69.4	79.7	128.9	97.9	88.3
Ball day Ceramics	121,5	128.6	198.4	1 <i>47.</i> 8	1 <i>74.5</i>
	118.0	118.1	183.5	140.1	169.7
Fire clay* Refractories Clay products† Ceramics	2,785.3	2,222.3	4,167.6	4,701.1	6,090.4
	2,508.7	1,820.8	3,690.7	4,233.4	4,452.9
	80.3	221.4	230.5	249.6	1,331.9
	127.5	120.7	153.4	94.8	171.7
Misc. clays	403.5	409.3	1,210.2	850.4	10,848.7
	140.6	209.0	642.7	377.7	7,201.5
	31.9	32.6	298.0	202.4	3,144.5
	134.5	94.0	175.5	179.9	217.1
Total clays	4,042.6 225.5 2,624.8 66.3 429.0 324.4	3,941.0 430.9 1,914.6 78.1 464.7 325.8 95.0	6,664.0 873.2 3,863.7 359.5 607.8 475.5 175.9	6,628.7 627.3 4,411.9 215.8 546.3 346.5 180.7	18,053.6 8,534.5 4,567.9 3,160.4 550.6 471.2 217.8
Drilling mud Rubber	1 3 4.5 86.0	94.1	136.1	61.2	117.7

*Includes stoneware clay, †Includes brick, drain tile, sewer pipe and similar items of construction material.

In the table the data for 1937 and 1939 covered only clays sold in the open market; those for 1941 and 1943 covered clays sold and those shipped from the point of production even though used by the producer and not sold; only the figures for 1945 covered full output—sales, shipments and clays used by the producer at the point of production. It was in fire clay and miscellaneous clays used for heavy clay products that these differences were most pronounced. While it was unfortunate that directly com-

parable data were not available, the change in the basis of reporting showed some interesting sidelights. Much of the heavy increase between 1939 and 1941 was accounted for by the inclusion of shipments, while an even greater increase in 1945 indicated the relative magnitude of the "captive" operations not previously included. The distribution by uses indicated the versatility of most clays,



Pottery kilns, shaped like bottles, in the borough of Stoke-on-Trent, centre of fine British pottery

and their adaptability to widely different uses. For example, "china clay" (kaolin) went into paper, and more went into rubber and into refractories than into ceramic products. (See also Bentonite; Fuller's Earth.)

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Cleveland

Largest city in the state of Ohio and sixth largest in the United States, Cleveland had a population of 878,336 when the federal census was taken in 1940. Although the population of some of its suburbs increased rapidly during World War II, Cleveland in 1946 probably had about the same population as it did in 1940. Area, 73.1 sq.mi. Cuyahoga county, which includes the major suburbs as well as Cleveland, had a population of 1,217,250 in 1940. Its estimated population in 1946 was 1,250,000; its area, 463 sq.mi.

Four mayors headed the city's government during the 1937-46 period, and two of them demonstrated that the mayor's office was a stepping-stone to higher political positions. Harold H. Burton (Republican) was re-elected mayor in 1937 and again in 1939. In 1940 he was elected to the U.S. senate and subsequently was appointed an associate justice of the U.S. supreme court. When Burton

resigned as mayor in 1940 the city's law director, Edward Blythin, succeeded him. Blythin was defeated in 1941 by Frank J. Lausche (Democrat). Mayor Lausche was reelected in 1943 and in the following year was elected governor of Ohio. Upon Mayor Lausche's resignation in Jan. 1945, Thomas A. Burke, Jr., the law director, became mayor. Burke, another Democrat, was elected in 1945 to a term that expires in Nov. 1947.

Although Cleveland's budget gradually expanded during the ten-year period until it reached an all-time high of \$21,000,000 in 1946, the city's financial health improved; the municipality managed to reduce its debt materially in spite of large capital expenditures and was able to borrow money at low interest rates.

Unemployment relief was the outstanding municipal problem in 1937, 1938 and 1939. A series of crises was met by various devices such as transferring funds held for other purposes and issuing bonds against delinquent taxes as well as by considerable assistance from the Federal government.

In 1942 the city government purchased the Cleveland Railway Co. which operated street car, trolley coach and bus lines under a long-term franchise. A bond issue of \$17,500,000 was sold to finance the purchase, and control of the transit system was placed under a three-man board. During the period of gasoline rationing and heavy wartime employment, business boomed for the transit system; by 1946 the city had paid off all but \$1,700,000 of the indebtedness incurred in buying the system.

To keep pace with rising living costs, a series of wage increases was granted to city employees between 1943 and 1946.

Management of the city's Brookside zoo was turned over by the council in 1940 to the Cleveland Museum of Natural History. Mayor Burke in 1945 suspended Police Chief George J. Matowitz on a charge of laxity in permitting open gambling, but Matowitz was exonerated by the civil service commission after a hearing.

There were few changes among the elected officials of Cuyahoga county between 1937 and 1946. Joseph F. Gorman and John F. Curry served as county commissioners throughout the period. James A. Reynolds was the third commissioner until 1944, when he retired because of illness and was succeeded by John J. Pekarek. Martin L. O'Donnell took office as sheriff Jan. 4, 1937. At his death in 1941 he was succeeded by Joseph M. Sweeney, a retired police inspector.

In 1946 the city of Cleveland celebrated its sesquicentennial, the 150th anniversary of its founding by Moses Cleaveland. A series of civic events throughout the year marked the historic anniversary.

No event in history made a deeper impress on the city than did World War II. From Cuyahoga county, 160,000 men and women went into the military services of their country. Of these, 3,378 were killed, and thousands of others were missing or wounded. Many of the war casualties were restored to health in Cleveland at the Crile general hospital, which was dedicated in May 1944. After the war Crile hospital was taken over by the Veterans' administration and, together with the Brecksville veterans' facility completed in 1943, cared for the war veterans in the Cleveland area.

Government bond purchases made in Cuyahoga county in the eight campaigns held in and following the war period exceeded \$2,100,000,000.

The only major disaster in the city in the 1937-46 period was the spectacular fire at the East Ohio Gas Co. liquefying plant on the city's east side Oct. 20, 1944. One hundred and twenty-one persons lost their lives in it, scores of

others were injured, 82 homes and several industrial buildings were destroyed, and property damage was estimated at \$7,000,000.

Considerable major construction work was completed in Cleveland before the material shortages developed as a result of the war. Two outstanding projects were the Main avenue bridge, across the Cuyahoga valley, which cost \$7,200,000 and was opened Oct. 6, 1939, and the Aeronautical Engine Research laboratory of the National Advisory Committee for Aeronautics. The laboratory, located at Cleveland airport, consisted of 15 buildings and represented an investment of more than \$30,000,000. It was dedicated in 1943. Despite labour and material shortages, building permits in Greater Cleveland totalled \$43,-489,760 in 1945. Work was begun in 1946 on a lake front airport, and many other projects were in the blueprint stage. Voters approved bond issues for construction amounting to \$58,000,000. Real estate in the county was valued at \$1,721,614,890 on the 1945 tax duplicate.

The Community Fund idea of combining all drives for charity in a single campaign was originated in Cleveland, and each year it raised from \$3,500,000 to nearly \$6,000,000, depending upon the needs. During the war years the financial requirements of the United Service organizations were included and the fund was called the War Chest. It raised \$5,751,012 in 1944 and \$5,436,548 in 1945. The Cleveland foundation, administering bequests for charitable purposes, in 1945 was the third largest community trust in the U.S.

Bishop Edward Francis Hoban became the first coadjutor in the history of the Catholic diocese of Cleveland in 1943 and became sixth bishop of Cleveland in 1945 on the death of Archbishop Joseph Schrembs. Guy R. Lucas was appointed postmaster of Cleveland in 1945. George Szell became the conductor of the Cleveland orchestra in 1946, succeeding Erich Leinsdorf, who resigned after holding the post for three years. Dr. Artur Rodzinski preceded Leinsdorf as the orchestra's leader.

In Nov. 1940, the doors of the Cleveland health museum were opened for the first time. It was the first permanent health museum in the hemisphere. A campaign was launched in July 1945, to raise \$9,500,000 for the construction of four new hospitals in Greater Cleveland and the expansion of 13 existing ones.

After a suspension of six years necessitated by World War II, the National Air races were resumed at Cleveland airport in 1946. The four-day event drew 180,000 paid admissions. Paul Mantz of Burbank, Calif. won the \$10,000 Bendix derby, flying from Los Angeles to Cleveland in the record time of 4 hr. 42 min. and 10 sec. for an average of 435.6 m.p.h. The 300-mi. Thompson Trophy closed course race was won by Alvin M. Johnston of Niagara Falls, N.Y. with an average speed of 373.9 m.p.h. which also established a new record.

Commerce and Industry.—Completion of the \$6,000,000 river-widening project in 1942 gave the long freighters easier access to the up-river unloading docks and enabled Cleveland to maintain its long-standing record as the leading iron ore receiving port of the world. Heavy demands for steel during the war years kept the freighters running at top speed, and new records were established for ore delivery on the lakes. Cleveland interests controlled about two-thirds of the Great Lakes ore trade. In 1946 small freighters from Norway, Sweden and Belgium resumed their calls at Cleveland to load and unload cargoes, a trade that was halted during World War II.

Statistics for the port of Cleveland for 1937 through 1945 were as follows:

Year	Ore Receipts (Tons)	Coal Ship- ments (Tons)	Grain Receipts (Tons)	Total Freight In and Out (Tons)	Com- mercial Vessels Arrived	Passenger Traffic
1945	13,993,825	1,201,908	106,147	18,656,853	4.045	632,553
1944	13,479,985	1,488,136	106,898	20,526,477	3.052	555,982
1943	15,030,186	883,992	93,254	20,670,793	3.217	284.390
1942	14,650,000	629,325	78,228	21,963,485	4.937	383.611
1941	15,064,978	1,056,016	104,280	21,544,142	5,400	390,504
1940	11,438,391	1,123,988	75,062	17,673,926	4,929	368,808
1939	8,291,390	1,224,073	72,274	14,156,078	4,222	380,918
1938	3,096,662	783,196	53,591	7,121,193	3,393	398,938
1937	11,295,620	1,303,231	51,930	17,385,842	5,314	449,286

In 1946 the strikes of the United Coal Miners and the National Maritime union sailors on the lakes reduced the number of trips up the lakes made by the freighters.

The seven railroads carrying freight in and out of Cleveland were hard pressed to keep up with the traffic during the war years. In round numbers the annual freight car loadings for Cleveland were: 1937, 598,000; 1938, 355,000; 1939, 504,000; 1940, 765,000; 1941, 931,000; 1942, 891,000; 1943, 881,000; 1944, 925,000; 1945, 833,000.

As the ten-year period ended, Cleveland manufacturers were trying to overcome material shortages and other handicaps in order to recapture their normal export trade, which amounted to \$100,000,000 annually before World War II.

Traffic at Cleveland's municipal airport set an all-time record in 1945, when it handled 60,357 transport planes carrying 762,893 passengers but that record was eclipsed in 1946. In the first eight months of that year, 50,529 planes were handled and 768,452 passengers arrived or departed.

The city's largest banking institution, the Cleveland Trust Co., went over the \$1,000,000,000 mark in deposits as the ten-year period drew to a close. Clearing house bank clearings were \$11,529,428,884 in 1945 as against \$11,239,266,654 in 1944. Cleveland postal receipts were \$13,657,508 in 1945 and \$13,501,080 in 1944. In 1944 the Cleveland stock exchange handled the second highest volume of business in its history.

Production in the Cleveland industrial area tripled under the impetus of war demands. In 1939, the last year before the war influence was felt, the value of production in Greater Cleveland was \$996,703,000. In 1943 and again in 1944 the production figure reached or topped the \$3,000,000,000 mark and appeared to be levelling off in the postwar period above the \$2,000,000,000 mark. The number of wage-earners who produced this wealth of manufactured goods rose from 125,876 in 1939 to a peak of 247,400 in 1943. These workers were paid wages totalling \$178,521,000 in 1939 and \$572,300,000 in 1943.

To achieve this wartime production it was necessary to build, expand and reconvert many industrial plants. Cost of new plants erected in Greater Cleveland for war production was \$233,368,000. Expansion of old plants cost \$112,902,000 and reconversion of old plants \$58,966,000. Total war production in the Cleveland Ordnance district was valued at about \$5,000,000,000. Almost every conceivable wartime product was included in this total, but among the most important items were trucks, automotive parts, aeroplane components, machine tools, guns, ammunition, ships, tires, chemicals, radio, electric and electronic equipment.

Establishment in the Cleveland area of new industries in the postwar period indicated that production figures might remain above prewar levels. Among these planned new industries were two General Motors plants to be built at a cost of \$50,000,000.

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Climate

See METEOROLOGY.

Clothing Industry

World War II of necessity was the dominant factor in the clothing industry throughout the world during the years 1937–46, and in many instances speeded developments far beyond the normal course of events. New machinery, production methods, styles, construction, fabrics, merchandising methods, supply problems and factories were important items.

Machine Developments.—The manufacture of clothing became primarily a series of machine operations. In most garments manufactured during this era, there was little or no hand sewing and tailoring; all was done on highspeed machinery.

Among the new machines which greatly increased output were several high-speed, self-lubricating, lock-andchain-stitch sewing machines capable of 10,000 stitches per minute. Blind stitch machines, invisibly stitching the sheerest of fabrics at 3,500 stitches per minute, were developed. So called feed-off-the-arm sewing machines appeared for seaming up the sleeves and sides of shirts and jackets as well as trouser inseams and outseams, at tremendous speeds. Machines of various types were introduced to produce better and more uniform buttonholes than could be sewn by the most skilled worker—at hundreds of times the speed. The most radical, if not the most important improvement in "sewing" machines was the development of electronic devices to fuse certain plastics. These machines, while having many of the attributes of sewing machines, did not use needle and thread; they were operated by applying heat to thermoplastic materials, thus creating strong bonds for seams. They were available in many models, such as feed-off-the-arm, straight sewer, bar tack, etc.

In the cutting room, improvements in machinery kept apace of those in the sewing room. Automatic knife sharpeners on cloth cutters saved countless thousands of hours of labour. Machines were designed to prevent fusing of synthetic and plastic fabrics during cutting operations; special cutters were developed for rubber and other unusual materials. Great strides were made in cloth spreading-an operation previously performed primarily by hand. New cloth-laying machines were developed for all widths of fabrics of every weight and fibre; these incorporated many ingenious devices, including electrification which eliminated all hand labour, the machine starting and stopping itself. New high-speed drills and notchers aided in making markers. The use of the perforated marker increased substantially, particularly in the cotton goods industry. New ticket shading machines assured more perfect shade marking of the component parts of a garment; one of these printed a great variety of information pertaining to the garment and affixed the ticket all in a single operation.

Many new automatic or semiautomatic machines were developed for special operations outside the cutting and sewing rooms. These included tack button, snap fastener, strip cutting and slide fastener attaching machines. Of great importance was a new automatic folding machine which would fold over flat edges on any shape cloth patch at very high speed—thus allowing increased produc-

tion in sewing collars, cuffs, pockets, etc.

Pressing equipment was streamlined and improved. Despite the opposition of old-time pressers, many fingertip control automatic and semiautomatic pressing machines were installed. New electric steam irons and 100% steam irons increased the efficiency of pressing.

One of the greatest timesavers in clothing manufacture was the development of small attachments, usually to sewing machines, permitting the operator to perform two or even three operations previously performed by two or three persons. Here, perhaps, the greatest advances in the industry were made. Automatic thread cutters, edge trimmers, sew-pinkers etc., saved millions of man-hours. One of the most unusual and saving classes of equipment was the S.V. or special variety group of sewing machines.

Production Methods.—No single phase of the industry underwent so great a change as did the methods of production. Only in regular woollen and worsted dress clothing was the old system of bundle manufacturing retained. Other segments of the industry advanced to progressive-bundle, progressive-line and straight-line systems of manufacture. In the straight-line system each operator had only one garment or part of a garment at a time; when the operation was completed, that garment or part of a garment was handed on to the next operator for the next operation. Operations were made as simple as possible. Thus, the cut garment pieces were fed to the operators at various intervals; they performed their respective operations, and a completed garment emerged at the end of the line-not unlike automobile assembly. When properly synchronized, this method of production was highly efficient; it received its impetus from the development of the individually motored safety table which eliminated the old shaft tables. The individual table made for great mobility, since any operator and machine could be moved about the factory freely, with proper electric

In Britain and on the European continent, individual motors and tables were also widely used. European manufacturers, however, paid most attention to the conveyor belt system of production which required subdivision of operations, but instead of the operators handing the garment to each other they put the garment on a moving conveyor belt. Here, even more than in the straight-line system, absolute synchronization of operations was necessary. In both systems of manufacture, great attention had to be given to time and motion study and methods of handling.

Opinion varied as to the best method, depending on such factors as quality and availability of labour, constancy of style of garments, and condition of machinery.

Styles and Fabrics.—Styles changed during the decade, but not radically. Shoulders became not quite so wide, and almost all coats were drape models. No basic changes took place in regular dress clothing. Style was influenced by the great upsurge in sportswear, both spectator and participant; while the sportswear designs were not new, the great demand for them was unprecedented. In Britain, "austerity" clothes symbolized wartime economy, while in the United States numerous restrictions were enforced.

The accent in construction was on simplicity, probably because of the rising costs of material and labour. One-piece collars and cuffs, continuous facings, turned in plackets, centre-arm-split sleeves and other similar methods of construction required less labour.

The most interesting aspect of fabrics as they pertained to clothing was the rise of synthetics. Increased use of rayon, nylon and a host of other man-made fibres started in women's wear, moved to men's sportswear and then was introduced into regular dress clothing. Many of the technical problems raised by the use of synthetics were successfully solved, but a few still remained. Novelty fabrics were made from almost every conceivable material, including seaweed, aluminum, chicken feathers, glass, mink fur and milk; many being practical applications. Basically, however, wool and cotton dominated the industry. Methods and finishes were developed that permitted no shrinking of woollens, rayons and cottons. (See also Fashions, Women's.)

Merchandising Methods and Supply.—Year after year during the decade, the chain stores sold an increasing percentage of clothing. This modern method of merchandising forced various changes in the industry; manufacturers opened their own stores, tied up with certain chains exclusively, amalgamated with other manufacturers and specialized in only one or two items—all to meet competition.

During the years from 1939 to 1946, the clothing industry, like all industries, operated on a wartime basis. Machinery, fabrics, trimmings and supplies of every kind became almost impossible to obtain. Price ceilings were rarely observed in fabric and trimming purchases, thus fostering a black market which extended down to the consumer. Machinery was scarce, as makers converted to precision war work; in addition, there was a scarcity of labour, and resultant high wages. Thread, buttons and pocketing were virtually impossible to get without some form of priority.

The industry nevertheless acquitted itself well during the war. Despite all obstacles and handicaps, and in the face of unprecedented demands, the manufacturers of clothing turned out more and better garments than ever before.

While the war retarded development of new machines and fabrics, it speeded up new fabric finishes and functional dress designs. Members of the armed forces were specialized workers requiring special uniforms to overcome special problems. Newly developed were flameproof, mildew-proof and waterproof finishes. Cold-weather clothing was radically changed by the necessity of flying at great heights in extreme temperatures. Jungle wear presented the very opposite problems. Never was there so much research on clothes—most of it successful. The principle of multiple-layer clothing for cold weather and of porosity for hot weather stemmed directly from this research.

New Factories.-Throughout the world, new factories were erected to produce machine-made clothing in well lighted, healthy surroundings. Large plants were started in South and Central America, South Africa, Britain and Ireland. In Australia there was a concerted effort to move clothing factories away from congested areas. The same tendency was noted in the United States, where decentralization continued with the opening of many modern factories in the south and west. Modern factories were a far cry from the old sweatshop. The new, modern factory was a one-story, fireproof structure, with many windows, fluorescent lighting, rest and comfort rooms, a hospital room and cafeteria. Many plants provided scientificallyplanned music for employees. Increased employee benefits in the form of paid vacations, health and life insurance, sick funds etc., became commonplace. Wages based on incentive work plans became higher, hours of work shorter, skill greater.

In most countries labour was organized; in the United States, the great bulk of clothing workers belonged to the Amalgamated Clothing Workers of America or the United Garment Workers. In Britain and France, the trend

changed from custom-made to mass-produced, machinemade clothes, and skilled labour was in high demand.

The world-wide production of civilian clothing declined precipitously from 1939 to 1946. Huge stocks of uniforms did not offset this decline because of the incredible number of uniforms destroyed in the war. Mills and factories in Asia and Europe were ruined by war; in 1946, only those countries unscarred by the physical impact of shot and shell were able to produce their ten-year average. In the United States, the production of civilian clothing in 1946 surpassed that of any prior year.

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(S. L. S.)

Cloves

See Spices.

Coal

The three major producers of coal—the United States, Germany and Great Britain ordinarily accounted for two-thirds of the world total, and the countries listed in Table I, including all with known outputs more than 5,000,000 tons a year, accounted for about 94% of the total.

World War II brought great increases in the demand for fuel, some of which were met and some not. Sharp increases in output were made in the United States and Germany, but in Great Britain labour shortages brought a decline instead of the desired increase. In general, production suffered in countries that came under German occupation, though there seems to have been some exceptions to this rule; but without exception, the general disorganization that followed the liberation of the occupied areas resulted in marked declines for the time being. Consequently there were many sharp drops in output in 1945, and some as early as 1944. In most cases there was as yet little known about outputs in the occupied areas previous to the German surrender; after the surrender there was a period of some months in which conditions were so disorganized that little could be accomplished, even though the need was great. Even aside from the general confusion, labour and equipment were short, and outputs dropped to a fraction of their normal level. Poland and France were the first countries to overcome these handicaps and get outputs back to normal levels, and good progress was made elsewhere.

While European coal supplies for the winter of 1946 were still inadequate, the situation was much improved over the preceding winter.

United States.—The salient features of the coal industry in the United States during the decade are covered in Table II, while Table III shows production by states.

Because of overexpansion of production capacity and competition from petroleum, natural gas and water power, the coal industry in the United States was not in a favourable position to meet the adverse conditions of the depression years of the early 1930s, and output declined 45% between the peak year of 1926 and the low of 1932. While much of the lost ground had been recovered by 1937, the recession of 1938 pulled production down again almost to the 1932 level, and the 1937 level was not regained until 1940. War demand increased the output steadily up to 1944, with the successive outputs of 1942, 1943 and 1944 each making a new record high. The high of 1944 was 35% greater than the 1939 output, and 27% greater than

that of 1937. Production declined by 8% in 1945, but more from strikes in the industry than from lack of demand. The same situation was repeated in 1946, with strikes in April and May and again in November, causing another 7°_{10} decrease.

The 1946 production of bituminous coal to Dec. 21 was 514,607,000 short tons, as compared with 568,627.ooo tons in the same period of 1945, a decrease of 9.5%. Except during the strikes and vacation periods, production during the year averaged well over 12,000.ooo tons a week, and in six weeks exceeded 13,000,ooo tons, making it evident that an output of 630,000. 000 to 650,000,000 tons was quite possible. In anthracite the results were much better. The terms of settlement of the bituminous strike had been agreed upon just before the time for the renewal of the anthracite contract, so little time was lost, and production to Dec. 21 was 59,488,000 tons, against 54 -152,000 tons in the same period of 1945, an increase of 10%. Total output for the year, including both bituminous and anthracite, was estimated at 588,000,ooo tons, a drop of $7^{o_7}_{10}$ from 1945. As a result of the strikes and the reduced output that followed, coal supplies were short during much of the year, and the postwar readjustment to normal industrial operation was greatly hampered.

Europe.—The effects of war conditions can be traced in the figures of Table I.

Belgium. - The production rate ran a little better than 1,000,000 tons a month in the latter half of 1944 and the first half of 1945,

but with a low of only 190,000 tons in Sept. 1944. Improvement in the latter half of 1945 brought the monthly output up to 1,900,000 tons at the end of the year and 12,413,000 short tons in the first half of 1946-better than three-quarters of the prewar rate of operation.

Anthracite . . .

Grand total

Retail dealers .

Czechoslovakia.-Production was at a minimum at midyear 1945, recovering to 2,800,000 short tons in December. Improvement continued into 1946, with 15.523,000 tons in

1943 1945 1941 1942 1940 1939 1937 1938 683,278 650,821 630,934 512,256 17,567 570,518 18,226 643.02 497,388 446,343 United States . 14,887 50,000 32,914 32.896 28,218 Belgium . 33,639 52,428 Czechoslovakia 31,500 403,000 207,727 55,390 France . . . 552,003 251,216 12,691 Germany. . . Great Britain 269,261 9,892 15,944 39,945 Hungary . . Netherlands. 9.300 Poland... 42.014 7.496 10.396 Spain . . . U.S S.R. . . 181,400 160,000 5,035 140,150 6,230 28,100 32,966 4.696 6,614 27,000 33,000 16,500 21,000 31,101 23,800 32,915 Manchuria . 28,573 26.700 29 100 South Africa 18,933 17,324 19,248 20,986 Australia . . s Total . . . 1,708,000 1,610,000 1,760,000

Note: Figures in even hundreds or thousands are estimates.

Table II.—Data of the Coal Industry in the United States									
		(1	housands o	t short tons	}				
	1937	1938	1939	1940	1941	1942	1943	1944	1945
Production, total	497,388 51,856	394,644 46,099	446,343 51,487	512,256 51,485	570,518 56,368	643,021 60,328	650,821 60,644	683,278 63,701	630,934 54,934
Anthracite	442,313	345,547	391,813	457,832	511,373	579,762	587,428	617,022	576,000
Lignite	3,218 445,531	2,998 348,545	3,043 394,855	2,939 460,772	2,776 514,149	2,931 582,693	2,749 590,177	2,554) 619,576	576,000
Anthracite									
Used locally	5,653 46,203	5,035 41,064	5,495 45,992	5,309 46,176	5,956 50,412	6,418 53,910	6,608 54,036	6,061 57,641	6,391 48,542
Open-cut	5,696	5,095	5,486	6,353	7,317	9,071	8,989	10,953	10,056
Underground	46,160	41,004	46,001	45,132	49,052	51,2 <i>57</i>	51,654	52,748	44,878
Exports	1,914 397	1,909 363	2,590 298	2,668 135	3,380 75	4,439 140	4,139 166	4,186 12	3,691 0 1
Stocks, producers	2,154 50,400	1,458 45,200	994 49,700	939 49,000	1,274 52,700	798 56,500	329 57,100	445 59,400	130 51,600
•	30,400	40,200	47,700	47,000	01,700	00,000	0,,.00	07,7100	0,,000
Bituminous and lignite	•	1.505	4 4 4 7	4 4770	1211	4 000	F 0.50	E 0.50	2
Used locally	š 5	4,525 344,019	4,467 390,389	4,478 456,293	4,361 509,788	4,888 577,805	5,252 584,925	5,258 614,318	š
Open-cut	31,751 413,780	30,407 318,138	37,723 358,133	43,167 417,604	55,072 459,078	67,203 515,490	79,685 510,492	100,898 518,678	106,000 470,000
	13,145	10,490	•	16,466	20.740	22,943	25,836	26,032	
Exports	258	241	11,590 355	371	390	498	758	634	27,942 467
Imports	57,126	50,113	53.714	59,295	71,434	93.022	62,359	63,401	50.753
Stocks	432,603	338,086	377,773	432.757	494,088	542,214	596,164	591,830	560,060
	88.080	73,921	79,072	85,130	97,384	115,410	130,283	132,049	125,120
Railroads	74,502	46,626	63,514	81,386	93,138	100,850	102,460	105,296	95,738
Power utilities	42,871	38,245	43,979	50,973	61,861	65,636	76,403	78,887	71,626
Steel mills	12.853	, 8,412	9,808	10,040	10,902	10,434	11.238	10.734	10,084
Cement mills	5,247	4,483	5.274	5,633	6,832	7.570	5.851	3.789	4,215
Other industrial	209,050	166,399	72,225	82,560	104,099	113,542	140,929	128,280	123,277

Table III.—United States Production of Coal, by Principal Producing States (Thousands of short tons) 1937 1938 1030 1940 1941 1942 1943 11,062 1,197 5,663 41,912 14,759 12,047 1,152 5,923 46,783 16,943 2,948 2,675 42,557 15,324 1,454 6,589 50,610 18,869 3,231 3,579 12,440 1,511 7,187 19,301 1,985 8,086 17,160 1,718 8,324 18,752 1,972 8,168 Alabama . 15,464 1,574 6,949 54,703 22,484 2,939 4,008 53,710 1,701 3,145 3,254 1,251 Arkansas . Colorado . 65,071 72.631 25,065 2,771 3,437 63,211 Indiana . . 25,388 2,948 3,103 2,654 38,545 1,281 3,637 2,893 4 230 2,893 47,086 1,549 4,091 2,965 1,715 2,251 62,231 2,001 3,520 3,829 Kentucky . . Maryland . . 49,141 1,503 3,097 1,443 3,273 Missouri 3,436 2,732 1,239 3,273 2,804 1,230 2,072 20,289 1,188 92,584 5,185 3,285 Montana . 2,867 1,111 1,851 1,744 2,366 1,251 2,309 29,319 1,771 130,240 7,045 4,077 18,441 1,841 2,050 18,591 1,245 77,705 N. Dakota . . . 2,537 32,764 2,387 144,073 2,500 32,255 25,178 1,600 111,002 33.877 1,646 116,603 6,008 3,576 2,838 141,050 3,209 146,052 Pennsylvania . Tennessee . . 5,213 3,810 4,472 7,266 7,119 19,514 1,524 164,704 8,158 5,517 20,136 7.179 15,348 1,650 126,438 5,808 Virginia . . 12,283 1,567 13,531 20,280 18,105 Washington . West Virginia 93,288 5,204 1,610 108,362 5,373 118,646 158,804 .200 6,646 1,028 8.133 1,675 1.518 1,330 Total . 348,545 394,855 514,149 575,70⁰ 54,93⁴ 582.693 590,177

46,099

497,388

51,487

51,485

394,644 446,343 512,256 570,518 643,021

the first five months, 12% under the 1939 rate. Lignite production was slightly ahead of the 1939 rate, and all of the deficiency was in bituminous coal. From the scanty information, it appeared that production under German occupation was maintained more successfully than elsewhere, as the reported output for 1944 was above the prewar rate.

60,644

63,701

France.-Production sagged to little more than 1,000,000

tons a month in August and Sept. 1944, but later improved steadily. The total for the first six months of 1946 was 30,970,000 short tons—6% better than the 1937 rate, but 4% less than the 1939 rate. The output of March 1946 exceeded the 1939 monthly average.

Germany.—German production, as well as that in the occupied countries, was much disorganized after the surrender, and from the limited information available seems to have sagged in 1943 and 1944. However, too much dependence could not be placed on the drop of output indicated in Table I, as the low figures for 1943 and 1944 were from a different source than those preceding, and might not be directly comparable. Output increased from around 5,500,000 short tons a month in June 1945 to 18,500,000 tons in December; the improvement continued into 1946, with 20,400,000 tons in May and a total of 99,200,000 tons in the first five months.

Netherlands.—Production increased rapidly from 410,000 short tons a month in June 1945 to 687,000 tons in October. Output was irregular in the last quarter of 1945 and the first quarter of 1946, but rose to 840,000 tons in July, with a total of 5,041,000 tons in the seven months.

Poland.—In April 1945 coal production in Poland was little more than 1,000,000 tons a month, but improved rapidly, and had almost reached the prewar level by the end of the year. The total for the first half of 1946 was 23,852,000 short tons—14% above the 1938 rate.

Other Countries.—Coal outputs in countries outside the immediate war zone were in general increased materially above prewar levels. In most cases, maximum outputs were attained in 1942 or 1943, with subsequent declines.

Canada.—Production increased 20% to 1942, and then declined 11% to 1945. In 1946 output recovered much of the previous loss, reaching 12,976,825 short tons in the first three quarters, 9% above the same period of 1945.

India.—The peak output came in 1941, with an increase of 15% over 1937, and 4% over 1939, but the subsequent decline brought the 1945 output back almost to the 1937 level. The total for the first five months of 1946 was 13,132,000 short tons, about on a par with 1939.

South Africa.—The peak output of 1944 was 48% over that of 1937 and 36% over 1939, and the decline to 1945 was only 5%.

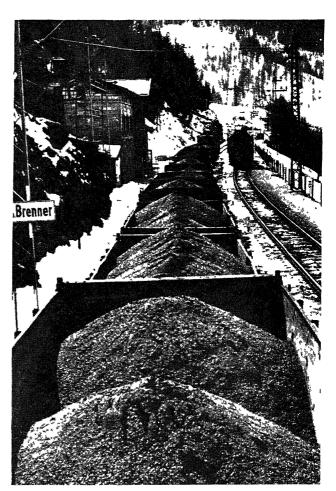
Australia.—Maximum production was reached in 1942, at 28% above 1937 and 15% above 1939, with a 14% decline to 1945. (See also Fuel Briquettes.) (G. A. Ro.)

Great Britain.—During the years 1937 to 1946, the output of coal from mines in Great Britain declined by about 60,000,000 tons, or more than 25%, and the cost to the consumer increased by more than 100%. This state of affairs was likely to have a serious effect on the country's industrial recovery and it was hoped that the National Coal board would revitalize the industry and bring about a better understanding between officials and workmen.

Table IV.—British Coal-mining Industry, 1936 and 1946

	1936	1946
Ownership of coal	Private	State
Ownership of collieries	Private	Private
Annual output (million short tons)	250	192 (approx.)
Number of persons employed	752,000	680,000 (approx.) under 20 cwt.
Output per day per person employed	23.5 cwt. 10s.	under 20 cwt.
Average daily wage	53%	75 <i>%</i>
Output carried by conveyors.	48%	70%
Average selling price at pithead	14s. 7d.	-

In 1938, the coal commission, consisting of five commissioners nominated by the ministry of mines, was set up to unify all the coal royalties. The capital value of the royalties was assessed by a tribunal at £66,500,000; this sum was divided among the coal-mining regions by a central valua-



German coal cars entering Italy through the Brenner pass in 1940. The British sea blockade forced Mussolini to rely on Germany as almost his sole source of coal supplies

tion board. The regional boards divided up their allotted sum and the whole was vested in the coal commission on July 1, 1942. This completed the first half of the commission's duties; the second, namely the amalgamation of individual collieries into economic units, had to be abandoned at the express wish of the minister of fuel and power in 1944.

Nationalization of the coal mines had been the political ambition of the Labour party for more than 20 years. When the party came into power in 1945 with an overwhelming majority in the house of commons, a bill to nationalize the coal mines and certain ancillary undertakings was drafted, and all coal mines were to be vested in the state. It was clearly established that the industry would not be controlled directly by the minister of fuel and power but through a Coal board appointed by him. The function of the board was to produce an adequate quantity of coal at a reasonable price without undue risk to the health and safety of the workmen, and to provide the miners with a sufficient and regular wage to ensure a fair standard of living. It remained to be seen how far the board could fulfil these functions.

Output.—Prior to the outbreak of World War II in 1939 the annual output remained (with minor fluctuations) about 230,000,000 tons, which was sufficient to meet home demands and such exports as could be sold in the face of competition. There was some unemployment among the miners, especially at the house-coal collieries in the summer, and there was a floating population of partially-



"Sticking It Out" by Werner of The Chicago Sun describes the strike deadlock of May 1946 between John L. Lewis and soft coal operators over the issue of a health and welfare fund for miners. Shrunken coal supplies threatened to paralyze U.S. industry, transport and commerce

employed men that could be drawn upon to meet an unusual demand for coal. By a judicious combination of working days and unemployment pay, a miner's family was able to live comfortably but not lavishly. With the outbreak of war, miners flocked to the fighting forces, especially after the collapse of France. The services had always had an attraction for the best type of young miner, and the result was that many older men had to continue at work; many of the less physically strong were forced to take a day off each week, and the less estimable type, found in every industry and walk of life, exploited the prevailing high wages by increasing absenteeism. In spite of increasing mechanization the annual output and the output per manshift steadily declined during the war years and in 1946 had reached a dangerously low level.

The daily coal output per person remained steady at 23 cwt. in 1939, but declined during World War II. Various reasons were advanced for this decline, such as the increasing age of the coal-face worker, lack of sufficient food, war weariness, etc. These possible causes were balanced by increased mechanization and labour-saving devices. Other suggestions were that the average miner, having earned sufficient to provide for his family during the current week, saw no point in working longer, for if he earned more than a certain minimum the government would claim it in "Pay as you earn" income tax. The payment of direct taxation like income tax was anathema to the miner. Nevertheless, whatever the reason for the 1946 figure, the daily output of under 20 cwt. per person employed had to be raised to a figure comparable with that of continental countries, that is, at least 30 cwt., if the coal industry were to prosper. A reduction of manpower would have to be accepted, wages would have to be increased and conditions improved.

Employment and Wages.—Before World War II, the number of persons employed in the coal-mining industry remained relatively constant at 760,000, but after 1939 it began to decline. There was naturally a big fall caused by the call up of the territorial army and reservists and to voluntary enlistment in 1939. After 1941, the number employed slowly declined, despite artificial "boosts" such as the posting of boys (Bevin boys) to the mines instead of to the forces. In fact, the normal decrease caused by age, illness, accident, etc., was greater than the intake. For many years, coal mining as a means of livelihood had received such bad propaganda that boys were averse to entering it.

The average daily wage showed a slow but steady increase before World War II, rapidly soaring after 1940. The miner, especially the day-wage man or boy, was paid a relatively low wage in 1939.

Shortly after the outbreak of war, it was agreed between the owners and miners that increases in wages to cover the increased cost of living should take the form of uniform flat-rate additions, but that the district variation in wages should continue. After the introduction of the Essential Works order in May 1941, the miners' leaders demanded the establishment of a national board to deal with and decide district questions and an increase in wages. The government refused to entertain the idea of a national board and referred the wages demand to a joint standing consultative committee which had been formed in 1936 and had functioned with increasing success for this very purpose.

The owners refused the proposal for a £4 a week minimum wage but granted a flat-rate increase of 1s. a day to adults and 6d. a day to other workers on the condition of absolute regularity of attendance. In Aug. 1941 this condition was withdrawn, and the advance became a flat-rate advance in wages. The year 1942 was a period of unrest, and strikes were all too prevalent. In June 1942 the Greene Board of Investigation was set up by the government; this board awarded an unconditional flat-rate advance of 2s. 6d. to adult workers and pro rata advances to juniors. It also awarded a national minimum weekly wage of 83s. for all underground workers more than 21 and 78s. for surface workers, these figures to be reduced to terms of shifts worked. Subsequent to this award, a joint national negotiating committee was proposed and accepted, with a national reference tribunal, under the chairmanship of Lord Porter, in case of dispute. At the end of the year the Miners' federation appealed to the Porter tribunal and were awarded £5 a week minimum wage for underground adult workers and gos. for surfaceworkers, with corresponding increases for juveniles. This award did not sufficiently differentiate between skilled and unskilled men. In April 1944 a new wages agreement was concluded which contained two important clauses: first, it could not be terminated until June 30, 1948, and secondly, there were to be no more demands for a wage increase.

Table V.—Wages and Wage-earners in the British Coal-mining Industry, 1938 and 1945

1938																	Wage Earners	Total Wages
10/6	•																	£107,000,000
1745	•	•	•	٠	٠	•	٠	٠	•	٠	٠	٠	•	٠	•	٠	700,000	£200,000,000

Many districts or mines could not afford these increases in wages, and the coal charges order came into being to make the increase possible. A levy which began at 5s. and was later increased to 12s. a ton was made on every ton of coal, and subsidies were paid to high-cost mines to cover the wages increase and guarantee a profit of 1s. 4d. a ton.

Mine Improvement.—From 1931 onward there had been a rapid increase in the use of coal cutters and underground conveyors. At first this resulted in a steady increase per man-shift, but after a time a saturation point appeared to have been reached.

In many mines and many seams of coal, the use of machinery resulted in an increase of output with less labour, but it appeared that machinery produced no benefit in some cases.

The most important technical document issued by the government during the war years was the Reid report. This was by far the most outspoken report ever publicly signed by mining engineers and it rightly received careful attention. At the same time many engineers did not agree with some of its findings.

(J. A. S. R.)

Coast and Geodetic Survey, U.S.

The year 1937 marked the beginning of a decade of exceptional achievement in surveying and charting. More than a century before, the United States congress had charged the coast and geodetic survey with the duty of surveying the coast. These functions were later extended to cover the determination of geographic positions and bench mark elevations from coast to coast to provide the basic control for mapping and engineering planning; the prediction of tides and currents; the observation of the earth's magnetism and the recording of its fluctuations; the study of earthquakes; and in 1926 the compilation of aeronautical charts to meet the needs of pilots of aircraft.

In 1937 the first series of sectional air navigation maps were completed; the first nine-lens aerial camera was constructed and used in flights for aerial-topographic mapping in areas difficult of access. The large area covered by a single exposure, 35 inches square giving excellent detailed view of the ground, gave promise of reduction in the cost of topographic work and ground control for accurate mapping. Automatic sea buoys replaced station ships previously required for radio acoustic ranging, a method of accurately locating a survey ship engaged in offshore hydrography. For the first time, tidal observations were observed at sea 27 miles from shore by means of the Dorsey fathometer, an improved type of echo-sounding instrument developed by the bureau. A crystal chronometer was adopted and used for gravity at sea observations and proved its value on land observations in eliminating time errors.

In the next two years, 1938-39, an increasing need for survey data was caused by activities of other agencies, engineers and navigators. The rapidly rising demand for the products of the bureau was met, without reducing its high standard of precision, by progressively improved methods and appliances. A new series of direction finding aeronautical charts was initiated. A comparison with chart issues of ten years previous showed for these years an increase in orders of 150% and 180% respectively.

In 1940 priority was given to co-operative projects with federal, state and public agencies and on the requirements of the U.S. army and navy in connection with the national defense.

Important projects were the establishment of precise fire control azimuth stations near coastal fortifications, and the analyses of tidal phenomena of various foreign waters to prepare predictions independent of foreign exchange agreements. Special air maps were prepared for civil pilot training. Marine and air chart issues were 25% over previous years. The records of the major earthquake shock in the Imperial valley, Calif., on May 18, 1940, furnished additions to earthquake data. Construction was com-

pleted of the most modern survey ship, the "Explorer," and the "E. Lester Jones," both of which engaged in surveys in Alaskan waters.

To meet emergency needs, survey expeditions were dispatched in four ships to Mayaguana, Trinidad, Antigua and Jamaica islands in the Caribbean, and surveys were accomplished within four months in connection with the establishment of these army and navy island bases for U.S. defense purposes.

The rapid extension of land, sea and air forces in 1941 taxed the resources of the bureau to meet surveys requested for naval operations, pilot training courses and general air navigation. There was a three-fold increase over normal issues of nautical and aeronautical charts. The year was marked by the successful use of several newly developed surveying devices, of which the most important were the Dorsey fathometer number 3 and the automatic depth recorder; a new portable tide gauge; a thermostat control for gravity, pendulum apparatus and a transit micrometer attachment.

A program of scientific co-operation with various American republics was inaugurated, initiated by tidal measurements in eight countries—Mexico, Costa Rica, Colombia, Ecuador, Peru, Chile, El Salvador and Venezuela—and a comprehensive series of gravity observations in Peru and Colombia.

The first full year of U.S. participation in World War II, 1942, was marked by the complete interruption of normal activities to utilize the personnel and facilities of the coast and geodetic survey exclusively to provide surveys required in the prosecution of the war.

Hydrographic surveys were made of designated coastal waters in advance of their use by ships of the navy for anchorage of patrol and escort ships. More than 50 unknown submerged reefs were located and charted. Along the Alaska coast, channels were surveyed across the foul areas to shorten routes and to permit passage of naval vessels inshore from possible submarine operations without danger of grounding on uncharted obstructions.

Ocean tides, tidal currents and geomagnetic observations were investigated in widely distributed localities. Results of these observations provided navigators with vital information. Magnetic observations made at selected bases furnished data on vertical intensity for purposes connected with magnetic mine defenses of coastal areas and for de-gaussing vessels. Records for seismographs were studied to furnish data on the nature of earth shocks and to advise in regard to proposed construction of war plants in regions subject to earthquakes. The nine-lens aerial camera was utilized extensively in Alaska. Production of charts was about seven times the normal issue. For purposes of security, they were placed on a confidential basis, and not made available to the public. The aeronautical charting program was expanded and extended to cover world areas to provide air maps of the best available information under the standards set for the U.S. series of aeronautical charts. The services of the commissioned officers of the coast and geodetic survey were in demand for special assignment with the armed forces because of their specialized training and experience. About 40% of the officers of the bureau were on duty with the army, navy and marine corps at the close of 1942.

The principal accomplishments of the survey in 1943 were the surveying and charting of waters of the western Aleutian Islands and the execution of geodetic control in Alaskan and Yukon territories. Four ships of the survey

fleet were operating to meet the immediate needs of the Alaska military sector command, and one vessel was assigned directly to the command of the North Pacific naval force. The work performed by the personnel of these survey ships contributed to the success of naval missions and to the transportation of military personnel, supplies and equipment in these previously uncharted waters. A fifth survey vessel was engaged in southeast Alaska surveying approaches to the Sitka base.

The Bristol bay coast of the Alaska peninsula was photographed and mapped by the excellent co-operation of the U.S. coast guard which furnished an amphibious plane and crew to fly the nine-lens aerial camera. Unfortunately during an aerial photographic mission to the western Aleutians, the plane crashed into Adak mountain and was destroyed. The accident, in which all of the party except two were killed, occurred shortly prior to the attack on Kiska Island, when survey work was being concentrated for that action.

Geodetic control surveys were made along the shores of Bering sea from the Yukon river valley to Seward peninsula, and through British Columbia and Yukon territory, from the summit of White pass to Tanana crossing. The work included triangulation, levelling and astronomic observations of first-order positions.

From an analysis of geomagnetic observations, isogonic lines were determined, or extrapolated from all available information, for use on air maps of the entire hemisphere. Naval operations and marine concentrations in U.S. coastal waters required the issue to navigators of 2,250,000 marine charts. Training programs and operations of the U.S. air forces and related aviation activities were reflected in the issue of 15,000,000 aeronautical charts.

In 1944, the coast and geodetic survey issued 10,000,000 charts to supply the constantly increasing demands for marine and air maps by the navy, merchant marine and air forces. In preparation for the invasion of the Philippines, the entire series of nautical charts of these islands were reprinted. The coast and geodetic survey had initiated surveys in the Philippine Islands in 1901, and there were available complete records of the shores of these islands for assault and landing purposes. This information was more accurate than that gathered for any other Pacific campaign. Surveys in the Aleutian Islands were executed by five survey vessels. A major geodetic project for establishing a continuous arc of triangulation from the U.S. through Canada to northwesternmost Alaska was completed. Geodetic control stations were established on Cape Prince of Wales, on Little Diomede and King islands in Bering sea. Extensions were made from this main aic to Kotzebue sound and along the coast of Norton sound to Nome, Alsk. On the south side of the Alaska peninsula, a triangulation connection was made to carry the standard geodetic datum throughout the Aleutian Islands.

Geomagnetic observations were made at five observatories and by five mobile units in Hawaii, Puerto Rico, Alaska and the United States. These observations provided useful data on the approach of magnetic storms for redirecting radio communications. The bureau published a new manual on hydrographic surveys and a glossary of geographic names of Alaska and Puerto Rico.

Under plans for providing complete surveys of the outermost Aleutian Islands and of the Maine coastal waters, 12 survey ships were engaged in 1945. A survey expedition provided essential vital information for naval activities along the Arctic coast east of Point Barrow. Isogonic

charts were published for army and navy flycis over world routes. In the earthquake regions of western U.S. 60 strong motion instruments were maintained, and studies of the vibrations in buildings and foundations were made to permit further progress in engineering seismology. There were 3,500,000 marine charts and 6,000,000 air maps issued. Geodetic operations reflected the shift from war requirements to preparation for postwar developments. In the Columbia and Missouri river basins, control surveys were executed for other federal agencies prior to investigations for flood control, reclamation and recreation water uses.

In 1946, the long-range program of surveys of the coast was resumed, and geodetic control surveys for river improvement projects and mapping in several states were extended. Airport surveys and flight charts were published and improvements printed in nautical charts. After thorough tests in Alaskan waters, the use of Shoran (see Radar) was proved to be of great value for hydrographic surveys. The radio ranger was used for the first time in offshore surveys along the New England coast.

A review of the first postwar year indicated an increased effectiveness in operations by virtue of the development of many special devices during the preceding decade. Success had been achieved in adopting electronic, acoustic and magnetic techniques developed during World War II. (See also Cartography; Geography.)

(L. O. C.)

Coast Guard, U.S.

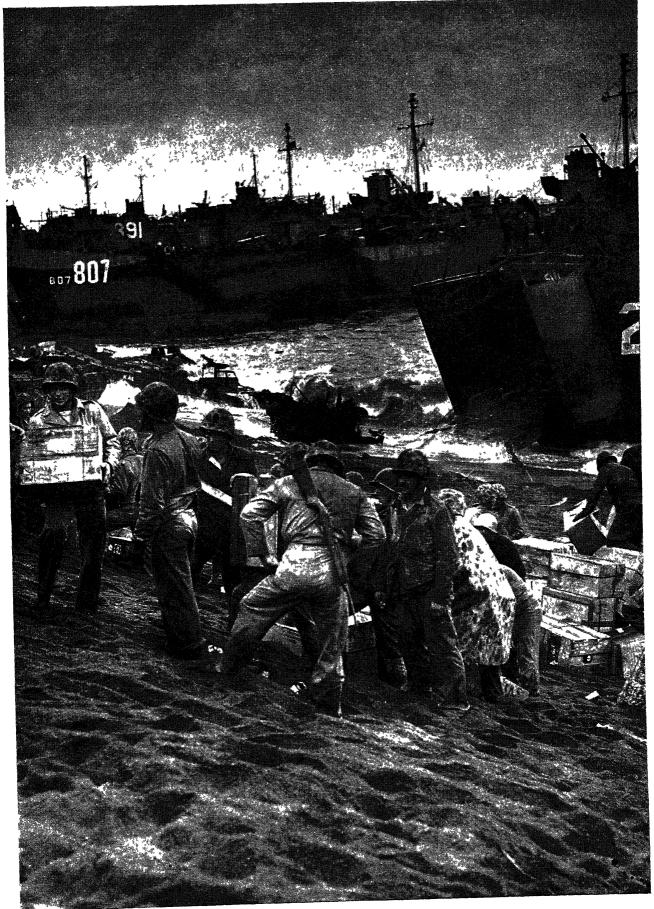
Represented during World War II on the staffs of U.S. fleet commanders as task force commanders, flotilla commanders of landing craft, convoy escort commanders, beachmasters in combat landing areas and various other capacities, the coast guard built a military organization which participated in every important campaign undertaken by the United States during the war.

In collaboration with other departments of the government, the coast guard also continued its primary peace time duties of enforcing customs, navigation, motorboat and all federal laws on the high seas and in navigable waters within its jurisdiction. Activities in prevention and detection of smuggling liquor and narcotics extended to Hawaii, Puerto Rico and the Virgin Islands, with the ninc coast guard air stations used to locate smuggling vessels, planes and illicit stills, report on obstructions to navigation, and conduct flood rescue operations.

Dramatic events in the line of duty during the decade 1937–46 were routine. The cutter "Shoshone," on a regular line island cruise in 1937, serviced Howland Island for Amelia Earhart's ill-fated flight; the coast guard patrolled 1egattas and marine parades and furnished facilities for a floating court in Alaska.

One of the major activities concerned aid to stricken areas in times of flood, hurricane and severe weather. Such aid in 1937 included assistance in the Ohio-Mississippi flood and aid to marine commerce during the season of heavy weather on the North Atlantic coast.

Federal rules and regulations promulgated by the secretary of commerce regarding the anchorage and movement of vessels, and loading and unloading of vessels with explosives and other dangerous cargoes, were carefully enforced through the various captains of the port offices. The number of captains of the port and their duties increased.



Two coast guard cutters and an oceanographic vessel were assigned to the International Service of Ice Observation and Ice Patrol in the North Atlantic during the 1937 season. The cutters afforded protection and ice warning to transatlantic shipping, and the oceanographic vessel carried out a program of observations dealing primarily with direction, rate and flow of ice-bearing currents. Regular annual patrols operated in the North Pacific ocean, southeastern Alaskan waters and in the Bering sea. The Bering sea patrol, over a long period of years, observed Japanese activity in that area, and the strategic importance of Alaskan shore establishments and control of Alaskan waters in national defense became an urgent need.

The transfer of the bureau of lighthouses and all of its functions from the department of commerce to the coast guard on July 1, 1939, brought with it more than 5,000 personnel and new administrative duties.

Enlisted men continued to study at the various resident schools within the service, and officer candidates received instruction at the Coast Guard academy, a military collegiate institution conducted by the treasury department at New London, Conn. Certified and classed among the upper 10% of the technical colleges of the United States, its graduates are on the same footing as graduates of an accredited civilian university, and the academy confers a bachelor of science degree upon graduation. Its candidates, unmarried and between the ages of 17 and 22, are selected by competitive examinations and are commissioned ensigns in the coast guard. Practice cruises are made from the academy each summer calling at U.S. and foreign ports.

U.S. coast guard tenders patrolled navigation channels to keep them open and safe for traffic during World War II. Below, a guardsman is shown working to free an ice-encrusted buoy while a crew member pelts it with a stream of boiling water



Scientific research during the decade included experimental work in radio engineering and communications, the rewinding machine of the Lyle gun, a marine gasoline engine, a diesel auxiliary engine, lubricating oil research and constant effort to improve lifesaving equipment and methods.

Coast guard officers continued to serve on national and international conferences concerning safety of life at sea, whaling, radio engineering, broadcasting, telecommunications, radio experts for aeronautics and on federal marine casualty boards. These conferences were held in the United States, Sweden, England, Cairo, Norway, Switzerland and Poland.

A national defense appropriation of \$10,700,000 for the coast guard marked its 150th anniversary in 1940. This provided emergency conversion of coast guard vessels for naval use and additional personnel.

With the outbreak of European hostilities in 1939, the United States organized the coast neutrality patrol, carried out largely by the coast guard with aircraft, vessels and coastal stations. The coast guard's performance of this duty was more efficient because of the civil nature of its duties.

The coast guard auxiliary, created by congress to educate yachtsmen and other small boat operators in the proper handling of their craft, proved to be a distinct contribution to safety of life at sea, competency in boat operation and safe navigation among vessels of all sizes upon navigable waters of the United States. The volunteer port security force, organized in 1942 in cities where there were maritime shipping facilities engaged in the transportation of the nation's vital war materials, assumed duties at docks and piers, standing regular watches, examining passes and permits and preventing passage of all unauthorized persons, maintaining constant watch for fire and enforcing all regulations.

Women were accepted but not to exceed 10% of the regimental force.

By 1940, nazi activity in the Greenland area was a twofold threat to U.S. security. German submarine "wolf packs" operated in Greenland waters to destroy all Allied shipping and to establish weather stations and bases for aircraft. The second threat was that the Germans might use Greenland, only six flying hours from New York, as a springboard to attack the western hemisphere.

The south Greenland patrol, established in June 1941 following the signing of an agreement relating to the defense of Greenland by the United States and Denmark in April, and the northeast Greenland patrol, established on July 1, had as their objectives the supply of bases and combat of nazi submarine action and other forms of axis activities in that area.

Another indication of increasing national defense activity was the increase in aids to navigation in 1940 and 1941, including the marking of foreign waters adjacent to newly acquired bases. In addition, establishment of the Atlantic weather patrol in Feb. 1940 placed two coast guard cutters equipped as floating weather stations between the Azores and Bermuda to collect and transmit data.

Coast guard aviation activities quickened pace in 1941, and planes engaged in antisubmarine patrol and convoy and escort duty. The coast guard established additional ship position offices at New Orleans, La., San Francisco, Calif., Seattle, Wash., Ketchikan, Alaska, and Honolulu, T.H., in 1941 to assure prompt assistance in the event of casualty to aircraft engaged in transoceanic and coastwise flights.

On Sept. 12, 1941, the coast guard cutter "Northland" captured the sealer "Buskoe," a Norwegian trawler under German operation. This led to the capture and destruction of a nazi radio station in Greenland. The "Buskoe" was the first axis ship captured by the United States in World War II.

Not unexpected was the transfer of the U.S. coast guard from the treasury department to the navy department by an executive order on Nov. 1, 1941.

When the Japanese planes attacked Pearl Harbor on Dec. 7, 1941, the coast guard cutter "Taney's" screen of anti-aircraft fire prevented the raiding planes from destroying the Honolulu power plant. Thus, the close of the year brought the coast guard well along its way toward being the fourth arm of the U.S. fighting forces.

Buoy tenders of the coast guard laid antisubmarine mine fields in 1942; and the chain of lifeboats, lights, lookout stations and greatly strengthened beach patrols, kept the coasts of the United States under a constant watch.

March 1942 brought the bureau of marine inspection and navigation into the coast guard, and, by an executive order, the authority and responsibility for the inspection and licensing of U.S. merchant ships and seamen rested upon the commandant of the coast guard. On June 1, 1942, the commandant created the Merchant Marine council to make studies and recommendations for the efficiency and welfare of merchant seamen and for the efficiency of safety appliances and equipment aboard merchant vessels.

In June 1942 a coast guard patrolman played a vital part in the capture of four nazi agents landed on the beach at Amagansett, Long Island. Information uncovered by the FBI indicated that Germany proposed to send a series of organized groups of saboteur agents to initiate a wave of terror within the United States. This information led to the establishment of organized beach patrol in July 1942. Primarily a security force, it was designed to protect U.S. shores against sabotage, axis submarines and landings, and "fifth column" activities along the coast. All patrols dovetailed with the regular army and navy defense forces and the FBI, with the coast guard acting in the capacity of a reporting agency.

In July 1942 the cutters "Foremost" and "McLane" sank Japanese submarines in Alaskan waters. And it was on July 4, 1942, that the Elizabeth City air station's special "provision bomb" was put to use in the rescue of the survivors of the S.S. "Everalda," a Latvian ship sunk by submarine shellfire off the coast of North Carolina. Developed by coast guardsmen, this "bomb" was a watertight container with about 20 lb. of provisions in it. Weighing about 22 lb., it contained rations, 7 cans of water, medicine, 1 pint of rye whiskey, a can opener, adhesive tape, salves for burns, cigarettes and matches.

Large coast guard cutters and patrol boats were on duty with the fleet in 1942, the naval sea frontier, and naval task forces convoying merchantmen and troop ships, battling submarines and patrolling sea lanes. The cutter "Hamilton," torpedoed in Icelandic waters, was the first coast guard vessel lost in the war. The cutter "Acacia" was lost by enemy action in the Caribbean, the cutters "Muskegat" and "Natsek" disappeared on North Atlantic stations.

Ten coastal districts maintained a beach patrol organization which, at the peak of its operation, employed approximately 24,000 officers and men, coverage totalled about 3,700 mi., exclusive of areas covered by strategically located lookout towers. By boat, jeep, truck, on foot and on horseback, coast guardsmen tirelessly patrolled the coasts from Maine to Florida, from Key West to Corpus

Christi and from southern California to the Vancouver sound.

In May 1943 the coast guard participated in the development and establishment of a seven unit Loran chain (see Radar) in the Atlantic. At the request of the chief of naval operations, the commandant, U.S.C.G., detailed a high ranking officer possessing radio and electronic experience for special duty with his staff. Later, complete responsibility for operation and maintenance of several stations were turned over to the coast guard.

Adm. Russell R. Waesche, commandant of the coast guard, made a 28,500-mi. tour of Pacific installations in 1943. Conferences held with Gen. Douglas MacArthur, Adm. Chester Nimitz, Adm. William F. Halsey, Jr., and Vice-Adm. Arthur S. Carpenter resulted in the establishment in the far Pacific area of merchant marine hearing units, similar to those already operating in England and North Africa.

Late in 1943 the British admiralty requested that the coast guard train 18 of their officers and 44 enlisted men at Floyd Bennett field in Brooklyn, N.Y., as helicopter pilots and mechanics, the British furnishing 8 helicopters. Mexican officers trained in antisubmarine warfare at the St. Petersburg, Fla., air station.

* * *

The coast guard passed another important milestone on Feb. 22, 1944, when the search and rescue agency was established at the request of the joint chiefs of staff, with its administrative affairs headed by the commandant of the U.S. coast guard. Its advisory board, consisting of representatives from the army services, the army air forces, the marine corps, the navy and the coast guard, engaged in studying and testing various devices, processes and techniques of air-sea rescue. The coast guard districts became coastal operational units under immediate direction of their own air stations.

Operational integration with the navy, with its increased demands for manpower, brought the personnel complement of the coast guard from 10,544 in 1937 to an unprecedented peak of 171,749 on Feb. 29, 1944, excluding the temporary reserve, medical and dental officers and nurses.

In June 1944 Gen. Dwight D. Eisenhower asked for a high-ranking officer, thoroughly familiar with merchant marine problems. The chief of the merchant marine inspection division of the coast guard was selected and left for England late in June to become a member of Gen. Eisenhower's staff at a time when the invasion of Europe on the French coast was giving rise to many problems involving thousands of merchant ships and seamen.

The coast guard serviced the Greenland weather stations which helped to establish the exact date of D-day.

The need alleviated, the beach patrol organizations as such and the activities involving the use of dogs and horses on the Atlantic and Gulf coasts, ceased operations in July 1944 and the revamped coastal lookout system took its place in meeting the needs of a limited coastal defense.

An impending disaster on the home front claimed concentrated action by the coast guard in the spring of 1945 as three successive floods inundated the Ohio-Mississippi valley. A coast guard task force and aircraft, including a helicopter, effected the rescue of more than 10,000 persons and evacuated thousands of heads of cattle.

At the same time coast guardsmen were participating in every important landing in every theatre of war. Among

warborn activities in 1945 were the transportation of Australian troops on the east coast of Borneo in Balikpapan and in Brunei bay, Sarawak, in 1945.

Upon acceptance by the United States and the Allies of the Japanese surrender, in Aug. 1945 the coast guard was the first of the services to complete demobilization plans. On June 30, 1945, separation centres were established at the most advantageous point in each of the coast guard districts in the United States, with an organization trained not only in procedures attending separations but also to provide dischargees with all pertinent information.

Important in postwar operations was the application of scientific advancement of radio and radar to operation of aids to navigation and improvement of navigational methods. Seventeen mobile Loran stations throughout the Atlantic and Pacific areas operated 40-odd Racon stations on the Atlantic and Pacific coasts and in Hawaii and Alaska. At the end of the war there were more than 40 permanent Loran installations. War aids to navigation were removed, but more than 36,000 aids to navigation for peacetime purposes were maintained; lightships not used in World War II took up positions. Many coast guard-manned army and navy vessels were decommissioned.

Maintenance by the coast guard of its air power continued, as did the administration of marine inspection and navigation laws.

The close of 1945 terminated port security activities, and an executive order, dated Dec. 28, 1945, returned the coast guard to the treasury department as of Jan. 1, 1946. Following a brief interim period after Adm. Russell R. Waesche, the wartime commandant, retired because of failing health, Adm. Joseph F. Farley took the oath of office as commandant in Feb. 1946.

Among the important developments of 1946 was the recommendation made to the Provisional International Civil Aviation organization conference held in Paris, France, in April 1946 that the establishment of internationally accepted markings for special search and rescue craft be studied, and that such craft, so marked, be accorded unrestricted rights of entry into the territories of the member countries for search and rescue purposes.

Important in the efficient functioning of the search and rescue task unit, was the transfer to the coast guard of the naval air station at Cape May, N.J., together with certain surplus property. At a somewhat later date a helicopter training program was carried out by the coast guard for navy pilots.

On May 16, 1946, the coast guard took custody of the buildings and grounds of the naval auxiliary air station, Mayport, Fla. Mayport replaced Curtis Bay training station as the east coast training station of the coast guard.

When President Truman's Reorganization Plan Number Three went into effect on July 15, 1946, all functions and persons of the former bureau of marine inspection and navigation were transferred into the permanent coast guard organization. On July 1, 1946, the strength of the coast guard was 22,500 enlisted men and 3,200 officers, including officers assigned to merchant marine inspection duties.

The ten years ending in 1946 proved the versatility of the coast guard's added new powers of achievement. Many times coast guardsmen proved their philosophy, "You have to go out, but you don't have to come back" in their service around the world and at home.

(R. R. W.)

Women's Reserve.—On Nov. 23, 1942, the women's reserve of the U.S. coast guard reserve was authorized by

public law 773, 77th congress, 2nd session, in order to furnish the U.S. coast guard with additional personnel. The war emergency had placed unprecedented demands upon the coast guard, as upon the other three armed services. Suddenly it was called upon to multiply its personnel some 16 times, from 15,000 enlisted men and 1,000 officers to 170,000 enlisted personnel and 10,000 officers. The SPARS, as the new reserve was named from the first letters of the coast guard motto, Semper Paratus—Always Ready—quickly became an integral part of the wartime organization.

The integration of women into a military service in the shortest possible time was not without its difficulties. The fact that legislation had been enacted enabling the coast guard to enlist women and that the ranking officers of the service saw the necessity for using the skills and talents of women to accomplish the tasks assigned the coast guard, did not guarantee the wholehearted acceptance of the innovation on the part of all of the men of the service. The primary mission of the first women who entered the coast guard was to prove to the officers and men with whom they were associated that they could do their jobs not only efficiently but without disrupting military habits and customs.

The success of the first women assigned to duty stations had a most auspicious effect upon the subsequent use of women. Whereas officers of the coast guard first estimated that they could use 3,000 enlisted women and 300 officers effectively in their organization, they eventually found that they could, and did, use 10,000 enlisted women and 1,000 officers. As the SPARS demonstrated that they could do the jobs assigned them, the number and variety of jobs they were called upon to do expanded rapidly. By war's end enlisted SPARS were serving in 30 different ratings and accounted for 1 out of every 17 enlisted persons in the service. SPAR officers, who numbered 1 in every 10 officers, were serving in a great variety of administrative jobs. The ratio of women to men was higher in the coast guard than in any of the other services.

The greatest numbers of enlisted women were used in yeoman and storekeeper ratings which made use of their civilian skills as secretaries, typists, stenographers and bookkeepers. Large numbers, however, were trained as radiomen and served with distinction in the communications service. Others served as pharmacists' mates, cooks, bakers, printers, instructors, switchboard operators, drivers of motor vehicles, parachute riggers, air control tower operators, chaplains' assistants, sound motion picture technicians and in numerous other specialist ratings.

Over one-half of the SPAR officers served in a variety of office administrative positions, while the remainder was divided between communications and pay and supply. Long before V-J day all coast guard coding boards in the continental United States were manned entirely by SPAR communications officers, and many pay and supply units were handled almost entirely by women. Most SPARS, both enlisted women and officers, were assigned to duty at U.S.C.G. district offices, although some were assigned to smaller outlying units.

All enlisted personnel, except those trained in the beginning of the program at naval facilities, were given recruit training at the U.S.C.G. training station, Palm Beach, Fla. Specialist training for yeomen, storekeepers and cooks and bakers, as well as pay and supply training for officers, was also conducted at this station. Other specialists were trained at various coast guard or naval facilities depending upon the facilities available. All general duty officers were indoctrinated at the U.S.C.G. academy, New London, Conn., and communications officers were

given further training in their specialty at the naval training school, communications-(W), South Hadley, Mass., or at U.S.C.G. training station, Atlantic City, N.J.

Capt. Dorothy C. Stratton, professor of psychology and dean of women of Purdue university, Lafayette, Ind., was named director of the women's reserve of the U.S. coast guard immediately upon the passage of enabling legislation creating the new organization. She served throughout the wartime life of the reserve. In Jan. 1946 Capt. Helen B. Schleman, who had served as assistant director from the beginning, was named director and served as such until demobilization was completed on June 30, 1946.

As women in the women's army corps and the naval reserve demonstrated that they could successfully carry out the duties assigned them, congress liberalized in a number of ways the legislation under which the women's reserve operated. The SPARS, along with the other reserves, benefited from the new legislation. For example, restrictions on commissions for women officers were modified. The SPARS were allowed one captain and all restrictions on ranks below that of captain were removed. Assignment to duty in Alaska and Hawaii was permitted, benefits were liberalized and made the same as for the male military personnel.

The new reserve, although drawing fire from the public on a number of scores, was able to avoid criticisms in certain areas. The fact that women officers and enlisted women wore the same basic uniform elicited rather general approval, as did the provision of adequate and reasonably attractive barracks for the women.

Anticipated discipline problems largely failed to materialize. The fact that all members of the women's reserve were volunteers and that the minimum age limit was 20 no doubt contributed to keeping disciplinary problems to the minimum.

The most important factor was undoubtedly the strong desire of the members of the women's reserve to make (D. C. SN.) good in the service.

Coaxial Cables

See TELEPHONE.

Cobalt

World production of cobalt was of the order of 4,000 short tons annually prior to World War II, distributed approximately as follows: Belgian Congo 40%, Northern Rhodesia 30%, French Morocco 20%, Burma and Canada each 5%, with a few odd tons from other countries. During the war years output declined in most countries except the Congo; known production averaged some 3,500 tons, but may have been larger as complete data were still lacking at the end of 1946. The U.S. had no prewar production but developed a small war industry, increasing from 64 tons in 1940 to 382 tons in 1943, and an estimated 575 tons in 1945, mostly from Cornwall, Pa., Fredericktown, Mo., with small amounts from Idaho.

Two-thirds of the world's wartime production of cobalt was absorbed by the U.S., with imports ranging from 2,000 to 3,000 tons a year.

Consumption shifted radically after the cessation of hostilities, as is indicated by the following quarterly totals of approximate uses of different kinds, in short tons:

			19	45		19	46
	1944 average	I	II T	III	IV	I	11,
Metallic uses Salts and driers Nonmetallic uses	475 82 23	575 98 22	568 98 34	342 79 38	233 83 51	231 103 68	279 132 76
Total	580	695	700	459	367	402	487

Metal consumption was mainly in cobalt alloys and alloy steels, in approximately the following proportions: stellite and carbide-type alloys 50%, magnet steels 30%, high speed steels 10%, other uses 10%. All of these uses contributed largely to the war program. Nonmetallic uses were largely in fruits and pigments. Though the wartime supplies were never abundant, that they were adequate was evidenced by stock accumulations of some 3,700 tons; it must be remembered, though, that war stocks were accumulated not from surplus output, but by stringent economy in essential uses and curtailment of nonessential uses.

Production in the U.S. dropped with the cessation of hostilities, but consumption increased to 1,398 tons in the first half of 1946.

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Cochin-China

See French Colonial Empire.

Cocoa

The United States consumption of cocoa (cacao), from which chocolate products are made, increased steadily from 1900 up to 1936. Production in both South America and Africa overtook demand, and the market dropped in 1937 to such low levels that a movement was started by producers to withhold supplies from the market until prices improved. Consumption increased in other countries, but imports into the U.S. continued lower than the record of 1936, 682,947,000 lb., until 1941. World production of cocoa increased eight times between 1900 and 1939. South American countries-Ecuador, Brazil, Costa Rica, the Dominican Republic, Panama and Venezuelaproduced 60% of the world total in 1900. The West African coast expanded production rapidly and by 1937 was producing about 66% of the world total. Other tropical countries-Ceylon, Samoa, Netherlands Indies and the Philippines—produced about 4%. Most of the African crop was marketed in Europe, while 65% of the South American crop was imported into the U.S. Prior to World War II, Europe was beginning to be a big buyer of South American cocoa. The war cut Europe off, and most of the South American crop went to the U.S. World production of cacao beans in the prewar period 1935-39 averaged about 1,442,000,000 lb., of which about one-third was produced in South America and the rest in Africa and other tropical countries. Production declined until 1944, when the world crop was estimated at about 1,000,000,000 lb.

U.S. Imports of Cocoa, 1937-46 619,051,000

1937 · · · 1938 · · · 1939 · · . . . 453,097,000 . . . 663,779,000 . . . 728,950,000 . . . 692,922,000

The discovery that cocoa has high food value and the growth of the milk chocolate industry stimulated consumption both in the U.S. and elsewhere before the war. Consumption would probably have continued to increase rapidly during the war had shipping been available to take care of the beans. The U.S. armed forces were given large supplies, and civilians were severely restricted. In 1940, the British consumption was taken under control by the government and reduced 20%. The British government also purchased the crop from West Coast Africa to protect growers. Imports into the U.S. dropped to 239,651,-

000 lb. in 1942 from 692,922,000 lb. imported in 1941, but recovered to 682,314,000 lb. by 1944. The sugar shortage was a factor in reducing candy and chocolate manufacture. Cocoa surpluses grew in both Africa and South America. A part of the African crop was destroyed, and some of the South American crop was stored to be held until the end of the war. The Combined Food board made allotments during the war in accord with the sugar and shipping situation. About 80% of the U.S. supply of cocoa came from South America in 1942 and 61% in 1943.

The price of cocoa beans was definitely downward for two decades as the world production expanded faster than consumption. Ceiling prices were fixed by the Office of Price Administration during its administration. The price of the ordinary grade cocoa "accra" was at the low point of 4.8 cents per pound in 1939 and increased steadily to 8.9 cents per pound by 1943. The high grade "arriba" ranged higher in price-10.5 cents per pound in 1939 to 11 cents per pound in 1943. In 1927, each grade sold for double these prices. With large world production and a strong and growing demand supported by the high regard for milk chocolate as a food, the future of the industry was considered very bright. The demand for chocolate had been affected by the general level of employment and wages, but in 1946 it was considered less as a luxury than it was a generation before. (See also CANDY.)

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Coconuts

The coconut industry had become quite important to the United States at the beginning of the decade 1937-46, as many essential uses were made of coconut oil. Since it is a tropical crop, all of the nation's requirements were imported, either in the form of oil or copra, the coconut meat. Imports of both oil and copra had increased after World War I. Oil imports rose from an average of about 275,000,000 lb. to a record of 379,652,000 lb. in 1938. World War II checked the commerce in oil so that by 1943 the imports had dropped to 42,668,000 lb. Most of the U.S. supply came from the Philippines, which was cut off from the U.S. in 1942-44. The small supply imported in these years came mostly from Ceylon, India and the French Pacific islands.

The imports of copra had increased more rapidly than those of oil after 1925 and reached a high record of 653,-182,000 lb. in 1933. In 1937, imports were 566,651,000 lb.; the war then caused a decline to the low point of 183,-926,000 lb. in 1943. The chief requirements for coconut oil in the U.S. in prewar years were for soap, drying oils and a small amount for food products. As oils became scarce, less was used in paints and soaps. In 1943, an excise tax was placed on coconut oil processed in the U.S., and in 1937 the supreme court upheld the law. This tax was paid back to the Philippine government. The large corn and cotton crops of 1937 also provided a large supply of oil in competition with coconut oil. Prices declined about 50% from 1937 to 1938. When World War II began, there was a large stock of coconut products in the Philippines. Considerable amounts were shipped to Europe for livestock feed, but this trade stopped in 1940 and prices dropped to a record low level.

Production of coconuts in South America had never been large, but when the Philippine supply was cut off, Honduras began to develop an export trade. Previously,

shipments had consisted only of nuts for the holiday trade and a small amount of copra. By 1945, imports from South America had increased to about 43,000,000 nuts. With the reopening of trade from the orient it appeared unlikely that South or Central American countries could compete successfully with the older sources of supply.

U.S. Imports of Coconut Products, 1937-46 (in pounds)

																			Copia	Cocono, on
1937 .																			566,651,000	344,775,000
1038	٠	•	Ť																467,470,000	379,652,000
1020 .	•	٠	•	•	•	•	•	•	•	•	-	٠	Ť	Ī	Ť		-		559,683,000	319,565,000
1737 -	٠	٠	٠	•	•	٠	٠	•	•	•	•	•	•	•	•	٠	٠	•	555,991,000	371,927,000
1940 .	٠	٠	٠	•	٠	٠	•	٠	•	•	•	•	٠	٠	٠	•	٠	•	240,000,000	258,579,000
1941 -	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	•	•	•	•	٠	•	٠	360,990,000	43.717.000
1942 .		٠			٠	•	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	•	٠	219,786,000	
1943 .		٠								٠		•	٠	٠	٠	٠	٠	٠	183,926,000	42,668,000
1944 .																٠	٠	٠	242,376,000	46,522,000
1945	-	_															٠		457,669,000	1,850,000
1946		Ī	•		-	-													400,000,000*	
*Prelim								•	•	-	-	•	-	-	-				• •	
TERRITM	1112	110		SIL.	1112	110														

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(J C. Ms.)

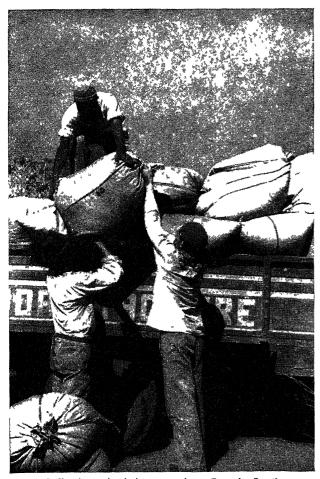
Coffee

Consumption of coffee in the United States increased more rapidly in the decade 1937-46 than in any period of the country's history. This was true of both total tonnage and per capita use. From an average of about 10 lb. per capita in 1900, the increase was very slow to about 13 lb. in 1937; then came a quick increase to nearly 17 lb. in 1941. The five years preceding 1937 were years of recovery from depression. Prices had dropped, and the imports into the U.S. in 1937 were about the same as they were in 1930. The price averaged 8.9 cents per lb. in 1937 and 13.1 cents per lb. in 1930. From 1937-41 the price doubled. In total volume the U.S. imports of coffee amounted to 1,734,137,000 lb. in 1937 compared with previous records of 1,728,569,000 lb. in 1930 and 1,414,000,000 lb. in

Coffee Imports to the U.S., 1937-46 (In pounds)

*Preliminary estimate.

The increase in coffee consumption was attributed to a combination of low prices, strong purchasing power by consumers, increased consumption by the armed forces and the campaign of advertising by the National Coffee association. The period of coffee rationing, Nov. 1942 to July 1943, reduced consumption for that period, but it recovered quickly when rationing ceased. The decrease was estimated to be about 25% during the period. The problem of overproduction was acute in 1937, and a stock of more than 30,000,000 bags (132 lb. each) was reported. Most of this was in Brazil. Together with the crop of 1937 of 25,400,000 bags this gave a supply for 1938 of more than 67,000,000 bags, while the world's annual consumption was only about 24,000,000 bags. The Brazilian government bought 30% of the 1938 crop and destroyed it. Between 1931 and 1937, Brazil destroyed nearly 50,000,000 bags of coffee. The Latin-American countries met in Cuba in 1937 to make a coffee marketing agreement but did not succeed in putting it into effect until 1941. The 14 American coffee-producing countries signed the Inter-American Coffee agreement to establish quotas on exports and U.S. quotas on imports, thus helping to stabilize the market. The quota system provided for the share that each country should sell to the U.S. and other countries. The outbreak of World War II demoralized the Brazilian coffee market for a time, but heavy shipments soon followed as



Coffee being loaded onto trucks at Fazenda, Brazil

many countries sought to build up their stocks. World trade increased quickly to more than 50,000,000 bags in 1939. Of the total quotas of imports, Brazil was allowed 58.2% in 1941; 47.9% in 1942 and 42.4% in 1943. Colombia was second with quotas of 19.7% in 1941, 26% in 1942 and 30% in 1943. All other countries shipped less than 4% each.

The price of coffee was fixed by the Office of Price Administration in Dec. 1941, and continued with small changes through the war. There was an irregular downward trend during 1930-40, when the average import price reached the extreme low of 6.2 cents per lb. Increases followed to 12.5 cents in 1941, 13.7 cents in 1942 and 13.7 in 1943. There was a wide range in the price of different grades. Colombian mild coffee ranged higher than other types and increased from a low of 9.12 cents per pound in 1940 to 16.25 by 1942, as compared with Brazilian (7.1 cents to 13.3 cents in 1942). In August, 1946, after the OPA law was restored, the ceiling prices of coffee were raised two cents a lb. to importers. A retail increase of 10 to 13 cents was granted to retailers at the same time. Subsidies to importers ceased on July 1 and were not revived because subsidy funds were limited.

The low prices did not serve to reduce production, because coffee is not an annually planted crop but a tree crop that should be harvested every year. The Dutch and Brazilians tried to stabilize prices by storing the surplus to be sold in years of short crops. But there were not enough short crops. A tax on new plantings was tried by Brazil. This was followed by the "sacrifice quota" plan, by which a part of each grower's crop was bought by the government

at very low prices to be destroyed. The area suitable for coffee production in Brazil was estimated to be more than 20 times the whole world area in coffee.

Industrial uses for coffee were the subject of extensive experiments during the decade 1937-46. A new plastic called "colelite" was produced in Brazil in a plant at São Paulo. Other uses were tested with considerable promise of success. The postwar prospects for coffee were not especially promising because of the expected reduction in demand in the U.S. and the loss of much of the market in Europe. Some increase in per capita consumption might, however, occur over another decade. Should this happen in Europe the large population there would require much more than world supplies of 1946. (See also Brazil; Price Administration, Office of.)

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Coiffures

See Fashions, Women's.

Coinage

During the years 1937-46 inclusive, the bureau of the mint operated mints—under the director of the mint at Washington, D.C.—at Philadelphia, Pa.; Denver, Colo.; and San Francisco, Calif.; the U.S. assay offices at New York, N.Y., and Seattle, Wash.; the U.S. depository (for gold) at Fort Knox, Ky., and the U.S. depository (for silver) at West Point, N.Y.

Electrolytic refineries were operated at the New York assay office and the mints at San Francisco and Denver. All coinage dies used in the mints were made in the engraving department of the Philadelphia mint.

The U.S. mint at New Orleans, La., originally established in 1835, was discontinued as of June 30, 1942. The appropriation granted for operation of the mints and assay offices during the fiscal year 1943 did not provide funds for the New Orleans mint.

The silver bullion depository, constructed on a site formerly included in the military reservation at West Point, was completed in Dec. 1936 and the first silver was stored there in Jan. 1937.

Following was the silver and minor domestic coinage of the U.S. mints by number of pieces for the calendar years 1936–45, inclusive:

(Cal	ene	da	r Y	ec	ır			No. Subsidiary Silver Coins (50 Cents, 25 Cents, 10 Cents)	No Minor Coins (5 Cents, 1 Cent)	Total
1936									184,843,732	538,132,989	722,976,721
1937									122,944,099	497,056,089	620,000,188
1938									52,813,591	227,903,099	280,716,690
1939									159,608,050	514,481,055	674,089,105
1940									168,593,952	1.040.885.030	1,209,478,982
1941									419,226,456	1,408,259,820	1,827,486,276
1942									525,981,572	1,104,673,800	1,630,655,372
1943									539,540,600	1,484,357,670	2,023,898,270
1944								٠	522,119,800	2,321,837,000	2,843,956,800
1945	•	٠	٠	٠	٠	•	٠	٠	396,637,401	1,664,058,100	2,060,695,501
T	ota	ı.	•			•			3,092,309,253	10,801,644,652	13,893,953,905

From the opening of the mint in 1792 through the calendar year 1935, 13,650,000,000 coins (in round numbers) were produced; of these, 12,600,000,000 were domestic and 1,050,000,000 for other governments.

During the ten years 1936-45, 17,344,283,847 coins were made or 27% more pieces than the total coinage prior to that period. Of these, 3,450,329,942 were for other gov-

ernments, 225% more than the previous total foreign coinage.

Coinage by the United States for other governments from Jan. 1, 1936, to Dec. 31, 1945, was as follows:

1936.						32,350,000	1942							307,737,000
1987 .						26,800,000	1943							
1938.						48,479,644	1944	•	•	•	•			788,498,000
1939.							1945	•	٠	٠	•	٠	٠	1,802,284,798
1940.														0.450.000.040
1941.	•	٠	٠	٠	٠	208,603,500	Total	٠	٠	٠	•	٠	•	3,450,329,942

Coins were made for China, Honduras, Colombia, Nicaragua, Cuba, Venezuela, Dominican Republic, El Salvador, Indo-China, Panama, Netherlands East Indies, the Netherlands, Curaçao, Surinam, Liberia, Australia, Peru, Belgian Congo, Bolivia, Ecuador, Great Britain (Fiji Islands), Belgium, France, Guatemala, Saudi Arabia, Denmark, Ethiopia, Philippines and Greenland.

The newly designed Thomas Jefferson five-cent nickel-copper coin was issued in 1938, replacing the Indian head or buffalo design coin. It was designed by Felix Schlag, with a likeness of Thomas Jefferson on the obverse, and Jefferson's home, Monticello, on the reverse.

Manufacture of the nickel-copper five-cent coin was discontinued in May 1942 because of the need of those metals for other uses in connection with the war effort. The Second War Powers act (March 27, 1942) provided for a five-cent coin of half silver and half copper, with authority to vary those proportions and to add other metals if in the public interest. The alloy for the coin, adopted after considerable experimentation, was finally determined as 35% silver, 56% copper and 9% manganese. The adoption of this alloy effected a saving for war uses of all the nickel and about one-fourth of the copper formerly used in the five-cent coin. Production of the coin composed of this alloy was started on Oct. 1, 1942, its design, size and weight (77.16 grains) being the same as the cupro-nickel coin. It was coined until Dec. 31, 1945, and on Jan. 1, 1946, coinage of the cupro-nickel alloy (75% copper, 25% nickel) was resumed.

Production of bronze one-cent coins was sharply curtailed beginning in July 1942 and entirely discontinued in Dec. 1942 because of the necessity of conserving copper for U.S. war industries. During the interim, extensive experimentation was made with various substitute materials in an effort to obtain a non-strategic material which would be satisfactory for coinage purposes and suitable for coin-operated devices. A zinc-coated steel coin was finally adopted, production of which was commenced on Feb. 23, 1943, pursuant to the act of Dec. 18, 1942.

The standard weight of the coin was 42.5 grains, compared with 48 grains for the bronze cent.

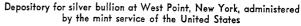
Production of the zinc-coated steel cent was discontinued on Dec. 31, 1943. The total number struck from the beginning of production in Feb. 1943 was 1,093,838,670 pieces, value \$10,938,386.70. Beginning Jan. 1. 1944, production of a copper-zinc coin was commenced, the composition of the alloy being 95% copper and 5% zinc. This was done under authority of the order of the acting secretary of the treasury, filed with the federal register, Dec. 15, 1943, pursuant to the act of Dec. 18, 1942, public law no. 815, 77th congress. The change was made as a result of the availability of fired brass cartridge cases to which copper was added to produce the alloy. The standard weight of the coin was 48 grains.

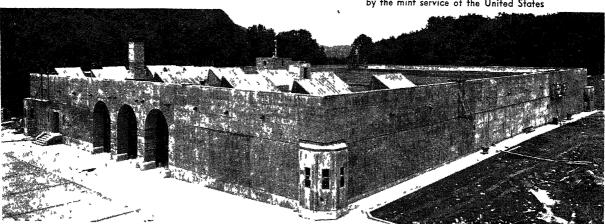
The design of the dime was changed early in 1946, the "liberty head" coin being superseded by the ten-cent piece commemorating President Roosevelt, released on Feb. 5, 1946. The new coin, designed by John R. Sinnock, the mint's chief engraver, was of exactly the same size and metallic content as the preceding dime. The "head," or obverse side, bore a portrait of Roosevelt facing left, the word "Liberty" around the left border, in the lower left field "In God We Trust," and the date, 1946, in the lower right field. The reverse side carried the torch of liberty centred with the olive branch of peace on the left, and to the right the oak branch signifying strength and independence; inscribed around the upper border was "United States Of America", around the lower border "One Dime"; across the lower field "E Pluribus Unum."

The winged liberty head dimes outstanding were to continue to circulate but no more would be minted. The first ten-cent coins bearing the pattern created by Adolph A. Weinman were struck in 1916. As of late Dec. 1945 when the last of the liberty dimes passed through the presses, the mint had put out a total of 2,677,232,448 of these coins. The new Roosevelt dime was the fourth portrait coin in the present series, all honoring former presidents. The others were the Lincoln penny, the Washington quarter and the Jefferson nickel.

Silver coins of the United States are composed of 90% silver and 10% copper. Their weights are as follows: dollar, 412.5 grains; half-dollar, 192.9 grains; quarter-dollar, 96.45 grains and dime, 38.58 grains. The five-cent piece is composed of 75% copper, 25% nickel and weighs 77.16 grains. The one-cent piece weighs 48 grains and its alloy is 95% copper and 5% zinc.

The medal division at the Philadelphia mint made all medals for the navy, coast guard and marine corps during





the war and many for the army and other government agencies. Approximately a million medals were delivered in the fiscal year 1946. Medals made for the navy, coast guard, marine corps and army included the navy cross, silver star, distinguished flying cross, navy and marine corps medal, air medal, Purple Heart, expert rifleman, expert pistol shot, life saving medal, Peary polar expeditionary and bronze star. The output also included 68,577 lapel buttons and 145,934 ribbon bars. Orders for medals, instead of decreasing with the end of the war, increased almost 1,000%. In mid-1946 the mint had on hand orders for approximately 10,000,000 medals, requiring further streamlining and modernizing of the medal department. (L. Ho.)

Great Britain, Commonwealth and Europe.—No gold coins were minted during the years 1937–46 in Great Britain, the dominions or on the European continent. Nevertheless, the royal mint of London and all the mints of the countries concerned were fully occupied, owing to the increase in the production of token moneys.

As early as 1937, the last year for which an annual report was published, the royal mint was unable to cope with the increased demand and had to enlist the assistance of two private mints in England. This was due to the increased demand for silver, bronze and brass token moneys, both for home requirements and for the empire, brought about by higher prices and improved conditions of employment during the years preceding World War II. During the war, the demand for token moneys continued to grow. Military requirements accounted partly for the additional demand. The increase of the number of wage earners and their incomes was mainly responsible for a higher demand in Great Britain, while higher produce prices contributed to the increase in the requirements of the dominions and colonies. On the continent, similar tendencies were at work, even though shortage of metals induced some of the German-occupied countries to print notes of small denominations instead of having silver, bronze or nickel coins.

There was a particularly strong increase in the demand for coins by those British and French colonies which served as bases for military operations. Their backward populations were unwilling to accept notes on an increased scale, and the only way in which their increased earnings could be financed was through an increased issue of silver and bronze coins. As the European goods on which the native population could have spent its larger earnings became more scarce, a large part of the coins issued to them disappeared from circulation, through hoarding or ornamental use, and new consignments had to be dispatched to the colonies at frequent intervals.

The volume of coins held by the public increased heavily in India. Although the note issue also increased, larger volumes of coins had to be put into circulation to meet the requirements of the rural population, which was not used to notes and found them useless for hoarding. In order to entice food from its hoards, and thus to relieve the famine, the government sold gold and silver coins and bullion on a large scale. Notwithstanding the high price of such coins, there was a strong demand for them, for an increased buying power had been brought about in India by the industrialization of the country during World War II. Without the opportunity of hoarding gold and silver, people would have hoarded food and other goods to an even larger extent than they did, and a critical situation might have arisen.

The same device was applied by the British authorities in various parts of the middle east in order to counteract the effects of inflation on the price levels in countries under Allied occupation. A large part of the holdings of gold coins of the Bank of England and the South African Reserve bank was sacrificed for this purpose.

After the liberation of Europe, it became necessary to make similar use of gold coins in Greece. Inflation under German occupation had reached an extreme stage by the time the country was liberated, and in order to achieve stability it was first necessary to restore confidence by putting gold coins (mainly sovereigns) into circulation. Owing to civil disturbances and the fear of future political trouble, however, the stabilization of 1944 was unable to restore confidence in the drachma: More gold coins had to be put into circulation in an effort to moderate the second wave of depreciation during 1945-46. Sovereigns came to be regarded as the real standard of value of the country. While drachma notes were accepted as a medium of exchange, prices were fixed on the basis of the value of sovereigns in terms of drachmas. In the markets and in shops it was almost impossible to buy anything in the morning until the opening quotation of sovereigns became available; then the merchants adjusted their prices to the change in the price of sovereigns.

Gold coins came to play a somewhat similar part in other European liberated countries. In France there was a very large turnover in French and foreign gold coins in the black market during 1944–46. Their price rose well above the official parity, and remained at a heavy premium even after the devaluation of the franc at the end of 1945, but during the summer of 1946 the influx of gold coins from Greece and Mexico caused their price to fall.

During the early years of World War II, the compulsory surrender of gold coins in Great Britain and other countries to the governments and the seizure of private gold hoards by the German occupation authorities on the continent, resulted in a decline of gold coins held outside official reserves. Toward the end of the war and after the war, however, this trend was reversed. Private hoards of gold coins in India and some continental countries, were probably much larger in 1946 than they were in 1939. During the concluding phases of the war and after there was some hoarding of silver and even of bronze and nickel token moneys in countries such as Greece, Hungary and Rumania, where inflation had reached such an advanced phase that the metallic value rose well above the face value.

In Sept. 1946 the British parliament passed a Coinage act under which no more silver coins were to be minted for the United Kingdom; the existing silver coinage was to be replaced by coins of a copper-nickel alloy. The object of this measure was to avoid having to spend foreign exchange on imported silver and to repay in kind silver borrowed from the United States during World War II.

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Coke

The major use for coke continued to be in the production of pig iron, and the trend of output during the years of World War II was determined largely by a country's need for and ability to produce pig iron. So far as available, data on production in the major countries are shown in Table I.

Coke requirements in the United States were greatly increased by war demands for iron and steel, and output expanded nearly a half over that of 1937. Demand did not reach its peak until 1944. Production began to lag in 1945, but did not drop heavily even after the close of the war, being maintained by the need for iron and steel in the reconversion of industry to a peacetime basis until reductions were forced early in 1946, first by a strike in the steel industry and then another in the coal industry. Even though the 1945 output declined a% from

output accorded 9/0 from
that of 1944, it was still a quarter larger than that of 1937,
and an eighth above the peak of 1929. Reduced by low out-
put during the periods of the steel and coal strikes, which
extended over most of the first quarter of the year, produc-
tion for the first three quarters of 1946 declined to 38,-
407,125 tons of by-product and 3,077,916 tons of beehive
coke, a total of 41,485,041 tons, as compared with 52,339,-
100 tons in the corresponding period of 1945. Normal pro-
duction also suffered a further shrinkage, caused by the
second coal strike of 1946, in November and early Decem-
ber.

While coke production in Canada remained relatively small as compared with that of the United States, it was enlarged even more by war demand; the peak output of 1944 was 62% greater than that of 1937. Furthermore, the figures in Table I include only by-product and beehive coke; besides oven coke, there was an output of breeze and gas retort coke which, when added to the other, would increase the totals by 400,000 tons to 500,000 tons a year, or about one-sixth. As in the United States, production in 1945 receded from the war peak, and continued to decline in 1946. Output in the first eight months of 1946, including breeze and gas retort coke, was 2,207,000 short tons, against 2,638,000 tons in the same period of 1945. (G. A. Ro.)

Colchicine

See HORTICULTURE.

Cold, Common

The common cold is probably not a single disease entity, but includes a group of conditions with similar symptoms. Colds and infections of the upper part of the respiratory tract are responsible for an enormous amount of temporary illness and enforced absence from employment. In Dec. 1941, a one week's survey indicated that there were colds in one-third of all U.S. homes, with an estimated 18,000,000 persons afflicted. There were more colds among children under ten than in any other age group. The survey suggested that about one person out of every four with a cold came under treatment by a physician.

The greatest frequency of common colds in the northern hemisphere seems to be during three periods—January and February, April and May, and September and October. The January and February peak is the most serious as judged by absence from work and the development of

		(Inousan	as or snor	1 101157					
	1937	1938	1939	1940	1941	1942	1943	1944	1945
	1.007	1,306	1,325	1.448	1.951	1,838	1.772	1,562	š
Australia	1,087		5,706	4,349	4,878	4,858	4,862	2,256	8
Belgium	6,706	5,396		2.559	2,681	2,795	2.986	3,546	3.316
Canada	2,187	1,994	2,017		2,573	2,679	3.637	0,270	0,2.0
Czechoslovakia	3,615	2,609	•	2,680	2,5/3	4,017	3,037	3,261	2,535
France	8,703	8,581	3	5,881	# . · · · · · · · · · · · · · · · · · ·	e (170	50 150		2,233
Germany	45,106	47,963	ş	53,974	56,109	56,479	58,159	59,500	
Great Britain	16,664	14,364	ş	17,193	16,292	16,688	16,186	15,771	Ť
India	2.094	1,916	2,146	2,065	2,204	2,075	1,739	4	¥
	1.866	1.917		2,191	2,021	1,839	2,200	ş	ş
Italy	3.709	3,481	2,433	2,609	.3	2,135	2,095	ş	\$
Netherlands	2,343	2.781	-/	-/3	ş	3	2.535	ş	1,030
Poland		22,800	18,400	18.200	3	6.708	8,599	10,900	.3
U.S.S.R	22,000		44,327	57,072	65,187	70,569	71,676	74,038	67,308
United States	52,3 <i>75</i>	32,495	44,327	37,072	00,107	70,007	7 1,07 0	,000	
Total	168,700	148,900	3	171,200	\$	ş	ş	\$	\$

Table I.—World Production of Coke

										To	ible II.—D		Coke Indiands of st		e United S	tates			
											1937	1938	1939	1940	1941	1942	1943	1944	1945
Production		•									52,375	32,495 31,658	44,327 42.882	57,072 54,014	65,187 58.482	70,569 62,295	71,676 63,743	74,038 67,065	67,308 62.094
By-product Beehive	:	:	:	:	:	:	:	:	:	:	3,165	837	1,444	3,058	6,704	8,274	7,933	6,973	5,214
Breeze made Coal charged	٠	•	•	•	•	٠	٠	٠	•	٠	3,985 74,502	2,700 46.626	3,406 63,514	4,165 81,386	4,555 93,138	4,752 100,850	4,941 102,460	5,116 105,296	4,721 95,672
Consumption, to	ota	ıl									51,272	31,063	44,953	57,026	64,944	70,107 54,695	71,407 56,701	72,971 57,072	66,074 50,653
In blast furn	ace	35		٠					٠	٠	33,571	19,035	31,422	41,839	49,470	24,073	30,701	37,072	20,023

severe complications. A high degree of contagiousness is generally recognized, as is the part played by the common cold in industrial absenteeism. In certain large industrial plants the pattern for colds gave the highest incidence in December, with a lesser peak in October. As would be expected, July was the month of lowest incidence.

Several studies of colds emanated from the U.S. navy. A hospital ship report showed that because of the continual arrival of large numbers of military personnel from temperate zones, acute respiratory infections in the tropical islands in the Southwest Pacific area were common. This raised an important military problem. One review of the frequency of common colds in the navy over a 60-year period revealed an estimated 2,500 per 1,000 men per year, or an average of two and a half colds per year for every man.

Both the number and the severity of colds increase following sudden drops in air temperature. This relation is more exaggerated among office workers than among factory workers, and among women than among men. Colds tend to become increasingly severe with age, but at the same time they occur less frequently. The workers in industrial plants which have air conditioning have fewer colds than those without it. Those who work in draughty places are reported to have an exceptionally high frequency of colds. More colds start on Monday than any other day of the week. A slightly increased tendency to acquire a cold was found in a small group of college girls accustomed to the use of cigarets. But the relationship between smoking was not demonstrated, since most of the smoking was done in large rooms which encouraged crowding and hence tended to spread colds by droplet infection.

Cause.—The cause of most common colds is believed to be a virus, a living substance too small to see under the ordinary microscope. There may be more than one kind of virus which can produce the symptoms of what goes by the name of common cold. Also, after the initial virus invasion, there is frequently infection with ordinary germs like streptococci and pneumococci. Probably this latter infection is responsible for many of the complications of the ordinary cold and perhaps for some of those which do not clear up rapidly.

Prevention and Control.—The decade 1937-46 brought increasing recognition of the part which exposure to those who already have colds plays in the spread of the common cold. Almost certainly the causative agent of the common cold is propelled into the air with small droplets when a

person coughs or sneezes. These droplets float about in the air and if inhaled by a susceptible person are likely to cause a new common cold. Crowding, consequently, provides ideal conditions for the spread of the common cold.

During World War II, crowded conditions were particularly difficult to control in military installations. This resulted in a number of efforts to decrease respiratory infections under military conditions. Especially important in this respect were the attempts to lay dust by oiling bedding and floors. In a British army experiment where wooden floors in barracks were oiled regularly, the average rate of respiratory infections, over a comparable period of time, was only 7 per 1,000 men as against 38 per 1,000 in a control unoiled unit.

Also during the decade, attempts were made to control the spread of common colds by ultra-violet irradiation and by so-called aerosols. The ultra-violet irradiation of the air held some promise under certain circumstances. Some experiments with aerosols likewise were successful. These aerosols consist of a vapour containing some substances which destroy bacteria. In one example of the use of aerosols, glycol vapours were employed in a home for convalescent patients. As a result the total rate of incidence of upper respiratory infections among the residents whose air supply was disinfected by glycol vapour decreased greatly.

Many attempts were made to vaccinate against common colds with the purpose of raising the resistance or immunity of large numbers of potential victims. Although a few reports suggested that vaccination does reduce the frequency of colds in college students, industrial workers, or other groups, the majority opinion seemed to be that vaccination does not have proved value as a means of materially reducing the frequency of the common cold. Vitamin C, or ascorbic acid, was also tried as a means of preventing colds, but the most carefully controlled studies did not show that this vitamin had any definite effect.

During World War II, especially in U.S. navy and air force installations in the United States, the residents of barracks were given one of the sulfonamide preparations, usually sulfadiazine, in fairly small doses for the lengthy period when respiratory infections were at their worst. Extensive reports on this subject were made, and the evidence seemed clear that such sulfonamide administration definitely decreased, though it did not eliminate, some of the upper respiratory infections commonly classed as colds.

Variation in individual resistance to the common cold received general recognition. One student of the subject carried out tests on a large number of healthy students and reported a correlation between the ability to maintain a capacity for good response to effort and exposure and the ability to avoid the common cold. As a result, it was suggested that the causal agent of the common cold may be capable of producing symptoms much more readily when the normal defenses of the body have been made temporarily vulnerable as a result of fatigue.

Other methods which were tried to prevent common colds included a vaccine for spraying directly into the nose, the use of antiseptic snuffs and large doses of vitamins. Although those who originally reported trial of these methods mentioned good results in a high proportion, general confirmation was not obtained.

Treatment.—The treatment of the common cold did not make much progress during the decade. Neither the sulfonamides nor penicillin were found to be of value for ordinary colds or influenza. People who have had one cold do not seem to develop much resistance to other colds, at least for any prolonged period. This may be because sev-

eral strains of viruses can produce colds, or for other reasons; whatever the explanation, treatment based on building an immunity or resistance was not successful. Penicillin was given for colds in the form of a fine spray or aerosol to be inhaled. It did not seem to affect the cold itself, but might have some value in the prevention or treatment of some of the complications.

In one U.S. army study, sulfadiazine was found helpful in reducing the number of days spent in the hospital (all the patients in this group were hospitalized) and in treating and preventing the complications of "nasal pharyngitis." Powdered sulfathiazole was employed in one study by blowing it into the nose after shrinking the mucous membrane with ephedrine hydrochloride. Patients who received this treatment had to refrain from blowing the nose or clearing the throat for several hours. Conclusions on this method of treatment were not drawn at the end of the decade.

Since there was still no drug, vaccine or other preparation having a specific action on the common cold, the best treatment still seemed to be complete bed rest, begun as early as possible and kept up until symptoms are gone. Plenty of liquids and such soothing preparations for the nose and other symptomatic measures as are indicated in the individual patient are also advised.

Research.—Organized research on the common cold was a generally recognized need. A hopeful sign was the establishment of a Common Cold Research unit in England in 1946 by the Medical Research council and ministry of health. This unit was housed at the Harvard hospital near Salsbury, which was built and equipped in 1941 and given to the ministry of health by Harvard university and the American Red Cross as a place for research in communicable diseases. Because there still were no animals thoroughly satisfactory for studies on the common cold, it was announced that human volunteers would be required for tests carried out at this new unit.

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Colijn, Hendrick

Colijn (1869–1944), Netherlands statesman, was born June 22, 1869, at Haarlemmer Meer. He was Dutch prime minister from 1925 to 1926 and again with brief intermissions from 1933 to 1939. An advocate of world peace and economic stability, Colijn was chairman of the World Economic conference in London, 1933, and was also a prominent figure in League of Nations circles. His party won popular support in the 1937 general elections and he formed his fourth cabinet in June of that year. His fifth cabinet, however, lasted only a few days after taking office, July 23, 1939. An outspoken critic of German national

socialism, Colijn urged his country, in the months before the German onslaught of May 1940, to abandon its traditional neutrality policy for one of self-defense. A year after the nazi invasion, Colijn was arrested and interned in a concentration camp. The Netherlands News agency in London reported that he died of a heart ailment while still in nazi hands, Sept. 16, 1944.

Colleges and Universities

See Universities and Colleges.

Colombia

A republic located in northwestern South America at the juncture of the Isthmus of Panama with the continent, Colombia is the only South American country with both a Caribbean and Pacific littoral. Area: 439.714 sq.mi. The population was officially estimated in 1945 to be 10.701,-816; the census of July 5, 1938 showed a population of 8,701,816 and later official estimates were: 1941, 9,334,392; 1942, 9,523,200; 1943, 9,620,800; 1944, 9,905,748. The average population density for the entire country in 1944 was 22.52 per sq.mi. The principal cities (with later population estimates given first and 1938 census figures second) are the capital, Bogotá (434,240; 325,658), Medellín (215,-830; 143,952), Barranquilla (202,760; 150,395), Cali (133,-140; 88,366), Manizales (108,260; 51,025), Cartagena (100,-360; 72,767), Ibagué (76,215; 27,448), Cúcuta (70,039; 37,323), Bucaramanga (63,864; 41,714), Pasto (58,436; 27,564) and Ciénaga (45,428; 22,783). The population is largely concentrated on the eastern Andean plateau, the interior departments of Antioquia and Caldas, the upper Cauca valley and the Caribbean coast. Racially the population was classed as 68% mestizo, 20% white, 7% Indian and 5% Negro. The official language is Spanish and the predominant religion Roman Catholicism. Colombia has a unitary government in which the president is elected by direct vote for a term of four years but cannot succeed himself. There is no vice-president; a "designate" is elected annually by congress temporarily to succeed the president in case of his death or resignation. Military service for a period of two years is legally required of all males between the ages of 20 and 30. Colombia is divided territorially into 14 departments, 4 intendencies and 6 commissaries. Presidents during the decade 1937-46 were: Alfonso López, 1934 to 1938; Eduardo Santos, 1938 to 1942; Alfonso López, 1942 to 1945; Alberto Lleras Camargo, 1945 to 1946; Mariano Ospina Pérez, after Aug. 7, 1946.

The López Administration.—At the beginning of 1937 the presidency of the Republic of Colombia was in the hands of Alfonso López, who had assumed office on Aug. 7, 1934. A former banker with a brilliant position in business and social circles, the son of one of the richest coffee exporters, López had entered politics quite by accident in opposition to the Conservative party which had ruled the country from 1886 till 1930. His influence was decisive in launching the presidential candidature of Enrique Olaya Herrera, a Liberal, who won the elections in the latter year by a large majority because the conservatives had split into two large groups. López served as head of the Liberal party during Olaya's administration, and was afterward elected president without any opposition. While in office he carried out daring political, social, economic and fiscal reforms. He obtained the approval of congress for a great change in the system of taxation, increasing tax scales, establishing income and excess profit taxes. Congress consented to his proposals for constitutional reform,

which were to annul arrangements that had permitted the intervention of the Catholic Church in public education, and to settle the principles of state intervention in private enterprise. Strong resistance was being encountered by his government, which was upheld with enthusiasm by popular support and especially by organized labour. The political opposition left its conservative platform under the leadership of López' old friend and fellow worker in mutual campaigns against the conservative government, Laureano Gómez. The Conservatives had decided to abstain from voting, so that Congress was made up of Liberals exclusively. But within this party there were two currents, although not well defined until that time, one of the right and one of the left. The former tried to moderate the government's tendency toward social progress, while the latter tried to hasten it. In the centre, a group under the leadership of Eduardo Santos, owner of El Tiempo, the newspaper with the widest circulation in the country, tried to reconcile the two tendencies, and advocated the presidential candidature of Olaya Herrera for re-election. Olaya was at that time ambassador at the Vatican.

In Feb. 1937 Olaya died in Rome. Among the Liberal majority in congress a large group had from the first been proposing the candidature of Eduardo Santos, whereas the left wing supported Darío Echandía, the prime minister in López' government. Echandía resigned from the government to enter his name as a candidate, and was successful in obtaining the nomination. The oncoming elections for the chamber of representatives and the assemblies of the departments gave the people an opportunity to intervene in the selection of a Liberal candidate. On April 4 Santos obtained 85 seats in the chamber, and Echandía 25. The Conservatives did not vote. In addition there were 5 Independents and 3 Communists. Santos obtained a majority in all the assemblies of departments. The Liberal party convention later acknowledged him as candidate.

The right wing of the Liberals desired to make the outcome of the contest appear a popular censure of López, in spite of the repeated declarations of Santos regarding his intention of carrying on the policy followed by López. On one and the same day the government suffered two defeats, in the chamber of representatives and in the senate, and López announced his resignation to the senate on May 24. On May 26 the senate declined to accept it. The crisis ended with a clarification of the relationship between the Liberal party and the government. Santos made a journey to Europe.

López continued to push his social legislation. Agitated discussions went on about a land law which was intended to solve the problems arising out of the innumerable conflicts between the owners of large estates and the colonos (landless peasants). These colonos cultivated small sections of land after taking hold of them without the consent of the owner until the latter had them evicted by the force of law. These evictions often gave rise to fights between the police and the colonos and at times blood was shed. The new law established that landowners were to lose the title to such parts of their estates as had not been exploited economically during the preceding ten years, and that the land should go to those who had worked it. This ended the conflicts but in order to avoid further difficulties the landowners dismissed many of their former workers whom they had permitted to cultivate their lands, thereby reducing agricultural production considerably.

Union activity was strong during the López administration, and there were many strikes, including some in river transport and the railways, which were illegal under the constitution, and were ended easily with the intervention of the government. Unionism, which had begun to exercise its rights freely, abused the good will of the government toward its cause. But salaries increased considerably, and with them the industrial production and consumption of the country. As a result the treasury benefited from the increase in revenues, and a general prosperity began at that time, lasting through the decade.

Santos Administration.—In May 1938 Eduardo Santos was elected president of the republic without opposition, by 450,290 votes. The Conservatives who looked on his candidacy with sympathy, did not vote. The office was transferred to him on Aug. 7.

The administration of Santos began in a general atmosphere of amity, and in Sept. 1938 Laureano Gómez announced that the Conservative party would end its abstention from voting. Santos surrounded himself with moderate ministers, all of them belonging to the Liberal party. The Conservatives started political campaigns praising the position of the new president in relation to his party. But in Jan. 1939 when the campaign for the elections to congress and the assemblies of departments (which in turn elected senators) had begun, a clash occurred between Liberals and Conservatives in the village of Gachetá, in which 9 persons were killed and 17 wounded. Laureano Gómez accused the police of having fired at his fellow party members, and promoted sharp attacks in the press against the government and Santos personally. A meeting of the Conservative party issued a declaration stating the necessity for a personal armed defense of its membersa policy which was called acción intrépida (fearless action). The president condemned it as anti-democratic and as dangerous to the peace of the country. Some Conservatives refused to conform to the violent instructions laid down by Gómez. The primate of Colombia, Archbishop Perdomo, called the acción intrépida anti-Christian, and when the Conservative party convention met, a group of prominent members withdrew from it, although the majority elected Gómez as sole head of the party. In spite of his apparent success Gómez felt that he had been defeated by those resisting his policies and left the country. In the elections the Conservatives were routed. The Liberals obtained control of both houses. Gómez returned after a short while in order to enter the senate, where he now began a systematic opposition to the Santos government, an opposition which gradually increased in intensity toward the end of the president's administration.

The invasion of Poland by the Germans and the Anglo-French declaration of war led the Colombian government to apply the international laws of neutrality. It was decided that the planes of the commercial air line Scadta, founded by Germans and managed by German subjects, were to carry co-pilots of the Colombian air force on its trips. At the conference of the foreign ministers of the western hemisphere in Panamá, Colombia adhered to the measures of precaution and neutrality taken by all the countries of the continent. The conservatives opposed the foreign policy of the government. Ever since the civil war in Spain that party had shown sympathies for the totalitarian countries, principally because of its marked anti-communist tendencies.

After the invasion of Belgium and the Netherlands, President Santos defined the foreign policy of Colombia by saying that the country would continue to be neutral, but could not remain indifferent to the threat of totalitarian expansion. In June 1941 the government took several security measures. The pilots and German employees of Scadta were forced to withdraw from that air

line. Foreigners were torbidden all intervention in politics and all propaganda activities, and new regulations for their expulsion from the country were laid down. Colombia collaborated actively in the resolutions of the Pan-American conference in Havana, which formed the basis for joint hemispheric action as applied after Pearl Harbor.

Ever since the first year of the administration of President Santos, a movement had been rising within the Liberal party which aimed at re-electing Alfonso López for a new term as president, against the tradition of the country. (The constitution-prohibited re-election of a candidate for a period immediately following his term of office.) This movement based itself on the enormous popularity which López had enjoyed when he lett the presidency. López had gone to the United States with the intention of leaving politics and establishing himself in New York. Only in June 1940 did he inform his friends that he was ready to accept the candidacy. There were large groups which opposed López' re-election; President Santos himself appeared to oppose it in his newspaper El Tiempo, of which he was the guiding spirit. The Conservatives rejected the probability of López' returning to office. Laureano Gómez said in the senate that, if the Liberal party were to put López forward as their candidate, a personal attack might be made on that citizen. He explained his thoughts afterward by adding that the Conservatives would go as far as civil war to prevent a victory of López. The ambassador to Washington, Gabriel Turbay, also announced his intention to oppose himself to the candidacy of López. López returned to Colombia and began one of the most vehement and bitter political battles in the history of the nation. He fought both the government and that section of the Liberals hostile to him. Lleras Restrepo, minister of finance, left the cabinet and was appointed director of El Tiempo to start the campaign against López. In the elections of March 1941 López obtained a majority in the chamber and in many of the assemblies over his Liberal adversaries, but the Conservatives and the Liberals hostile to him formed temporary coalitions which frustrated his victory. In August the Liberal convention met again, at which López obtained a majority of only one vote. After agitated discussions it was dissolved without reaching an agreement, but the majority, the adherents of López, remained in session and proclaimed him candidate. Many Liberals, although adversaries of López, joined his candidacy. Lleras Restrepo resigned from El Tiempo and returned to the ministry of finance. With this event the conflict between the government and López began to disappear.

In Dec. 1941, a few hours after the United States had declared war on Japan, Colombia broke off diplomatic relations with Germany, Italy and Japan. Congress approved the policy of the government and empowered it to take the steps thought necessary for defense. Under these powers new restrictions were imposed on the activities of foreigners, especially the subjects of the axis countries. The Conservatives, who had hitherto opposed the foreign policy of the government, now remained silent officially, but a group of independent Conservatives continued to adhere to it.

Return of López.—The presidential campaign continued to absorb almost the entire interest of the people until in the elections of May 1942, López won by more than 200,000 votes over the Conservative-Liberal coalition which had supported the candidature of the Liberal Carlos Arango Vélez. Members of the coalition declared that

the elections had been fraudulent and partial to the government, but could not sustain their charges. The Liberal members of the coalition did not wish to join the Conservatives in refusing to recognize the election of López. López, having been declared elected, went to the United States to meet President Roosevelt, and returned to Bogotá at the end of July. At that time furious debates were going on in congress against President Santos, which had been started by the defeated candidate, Arango Vélez. On Aug. 7 López took over the presidency before a congress presided over by Uribe Echeverri and Arango Vélez.

The Santos government had been very effective in its administration. Its firm foreign policy was inclined toward the democratic cause from the first. In April 1941 Santos signed a treaty with the president of Venezuela, General López Contreras, by which the century-old boundary disputes between the two countries were ended. With this treaty Colombia finally concluded negotiations about its borders with all its neighbours.

In 1940 the government consolidated the internal debt in a settlement involving some \$23,000,000; it also made an agreement for the resumption of foreign government loans at the expense of the nation, which was approved by officials of the United States government and was later accepted by the Colombian bond holders. The government made a proper campaign for the defense of the price of coffee on the U.S. market, and entered into negotiations for an agreement on import quotas with that country; at the same time it stabilized prices at home through the creation of the National Coffee trust. It treated social problems with singular dexterity and solved hundreds of conflicts without resorting to force. It had fallen on that government to rule at a time full of difficulties because the war had restricted imports and disturbed commerce; yet it succeeded in maintaining a constant increase in the resources of the budget and in invigorating national economy through the creation of institutions fostering industry.

One of the most agitated and disturbed periods in the history of Colombia started with the advent of López' second administration. The president had defeated his opponents and undoubtedly had much popular support. But his struggle against the Conservatives, against groups within his own party and against the government had left wounds which, as it was shown later, had not healed well. The vigorous and polemical temperament of President López could not adapt itself easily to the reserve and hostility which he encountered with large groups of the intellectuals of the right; his friends, on the other hand, who had directed the electoral campaign against his opponents with strength and energy throughout the whole country, were not inclined to make concessions. The administration was set up on a homogeneous basis, with political associates of López in the government and the exclusion of those Liberals who had opposed him. The relations between López and Santos, who continued to maintain a decisive influence in politics through El Trempo, were subject to continuous crises. The decisions of the new government appeared as reactions to the preceding one. The Conservatives, on their part, deceived by the defeat of the coalition, started campaigns against the government which their own senators called sin cuartel (giving no quarter).

At the same time the Conservatives conducted another campaign, of a religious character, against the proposed concordat between the Holy See and Colombia. The

attack on the concordat, led by Laureano Gómez himself, was on the basis that it made concessions which, in the view of the Conservatives, were unacceptable to Catholics. The Conservatives passed censure on the apostolic nuncio in offending terms, as well as on the primate archbishop, who remained faithful to the Vatican and rejected the case made against the pontiff because of the concordat. A Catholic plebiscite was arranged against the new concordat, and many bishops and priests took the side of Gómez as opposed to that of the Holy See represented by the apostolic nuncio. The Liberals did not enter into the discussions, and in Dec. 1942 approved the concordat in congress after agitated debates. The government declared that it would not put it in force until the Holy See with the consent of the consistory had stated its intentions to carry it out. The Holy See deferred the matter. This religious struggle, commonly called a schism, was one of the causes of disorder which contributed to make the situation more difficult later on.

Another cause of discontent was the anarchic state of transportation caused by the wartime scarcity of vehicles and tires. The government had to establish rigid control of the means of transport on land, fixing the routes of various companies, closing parallel railway routes and taking control of the import of tires. At the same time it established ceiling prices for cars and tires. A series of drivers' strikes, encouraged by political trends, gave rise to grave disturbances more than once between 1942 and 1944.

In Oct. 1942 President López went to Venezuela at the invitation of the government of that neighbouring country, and his office for eight days was in the charge of Carlos Lozano y Lozano, the first vice-president. This visit was returned in June 1943 by President Medina Angarita. In the same year the presidents of Ecuador, Paraguay and Bolivia visited Colombia. On Oct. 26, 1942, Colombia, Ecuador and Venezuela, proceeding by agreement, broke off diplomatic relations with the French government at Vichy.

Year of Crisis.—But the worst year in this time of confusion and political crisis was undoubtedly 1943. This state of disturbance was largely attributed to the echo of great events in the world which had made all Colombians vacillate in their beliefs in the efficiency of the democratic principles which guided the republic. The elections in March passed peacefully, and the Liberals obtained a majority of 300,000 votes over the Conservatives, thus increasing their strength in both congress and the assemblies. But at that time, too, the first sign of disorder within the armed forces occurred when it was found that the secretary general of the ministry of war, General Eduardo Bonitto, was involved in a conspiracy; he was removed from office, condemned by court-martial and dismissed from the army. From then onward General Bonitto appeared as the leader in successive movements against the government, and the Conservatives endorsed him in their public declarations. General Bonitto had served as military attaché at various legations and embassies, on the military staff of Presidents Olaya and López, as chief of protocol in the chancellery, and only exceptionally in the active army. Until that time it had been thought that Bonitto was not capable of conspiracy. This first incident was not considered important and was taken more as a joke. But the Conservative propaganda began to infiltrate the army and especially tried to make López appear an enemy of the armed forces. The young officers' corps and some high officers with Conservative affiliations felt themselves encouraged by the coups d'état carried out in other countries.

With his characteristic daring, López also estranged business and industrial groups through his first measures to prevent the rise of prices and to curb inflation. He created price control, ordered the legal holdings of the banks doubled and took measures to freeze 20% of all business profits. These measures were received with indignation in financial circles, and all difficulties were attributed to them.

López also saw himself forced to bridle the abuses of unions with regard to strikes. As the government was struggling against these openly hostile forces, it found itself confronted by the grave consequences of a crime, allegedly committed by two officials and some agents of the national police in Bogotá, which had a retired boxer and occasional newspaperman, Francisco Pérez, alias Mamatoco, as its victim.

The opposition gave the murder of the Negro boxer the character of a crime committed by the state. The victim seemed to have had some obscure connections with a new group of conspirators which was then being investigated by the police, and on these grounds it was attempted to blame the responsibility for the death of the boxer on the government. Tremendous debates went on in congress. The details of the investigation were used to create scandals. The disclosure of demoralization in certain sections of the police corps created grounds for an attack against the government. The political exploitation of this crime was a masterpiece of propaganda and opposition such as the country had never seen before.

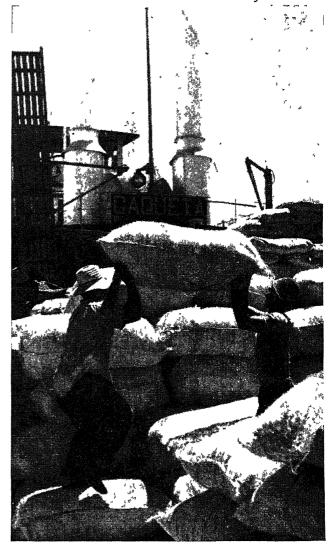
At the same time the president's son Alfonso López Michelsen, a young lawyer, was accused of interfering in affairs thought to be connected with government action. Congress occupied itself with these affairs, in which no proof whatever of any illegal activities could be found But in this atmosphere charged with distrust another supposed scandal was discovered. The government intervened in the conversion of the shares of a Dutch company, held in trust as a result of the invasion of the Low Countries, into shares of a Colombian beer brewery. It was a question of nationalizing these assets. The president informed the cabinet that some members of his family had invested money in the shares of the Dutch company, and that they would consequently profit if the proposed transfer were carried out. The cabinet decided that the action was advantageous to the financial interests of Colombian shareholders. In congress this action of the government was denounced as if the sole object had been to enrich members of the president's family, among them his son who had acted as mediator for transactions regarding Dutch shares, before the presidency of López. As the debate in congress increased in vehemence, the minister for foreign affairs, Gabriel Turbay, resigned, thereby creating a political crisis. The ambassador to Washington, Alberto Lleras Camargo, made a trip to Bogotá, and there the cabinet and the leadership of the Liberal party were restored through his intervention. López, who had some time before announced his wish to resign as president, agreed to continue in the government, but a few days later the grave illness of his wife obliged him to ask permission for a leave of absence. He did so on Nov. 19, 1943, after arranging for very thorough investigations of all the affairs mentioned above. As soon as permission had been granted to him, Vice-President Darío Echandía took over his office.

A section of the Conservative party asked for a truce with the new government. Echandía retained the ministers of López' cabinet. At the end of November a small coastal vessel plying the line between Colombia and its

islands of San Andrés and Providencia was sunk by German submarines. Previously other boats, also small, had been sunk savagely by the guns of German warships and many lives had been lost, but the protests which Colombia made to the reich through the Swiss government had been unanswered.

The government declared war on Germany and the axis countries and the senate, which had to decide on the measure, approved it fully. The Conservatives abstained from voting and were suspicious that the government was trying to obtain political advantages from these events. New security measures were taken, the war budget was increased, the property of German citizens was confiscated to compensate for losses caused by axis action, dangerous Germans were interned and control was established over news of military importance. Colombia undertook naval patrols along its coasts in collaboration with the United States navy, and also facilitated the transfer of U.S. aircraft to the U.S. bases in Brazil. In Jan. 1944, President López, then in Washington, signed the Charter of the United Nations by authority of the government.

Colombian dockworkers unloading bags of cinchona bark used in the manufacture of quinine. Shipments to the U.S. were stepped up during World War II to offset increased demands and a temporary block in other sources of the vital drug



Abortive Revolt.-Political agitation was stirred up again in Feb. 1944 when a judge detained Laureano Gómez for 24 hours while he investigated charges of calumny made against him by the minister of government. While Gómez was being held prisoner, a bomb, which a former member of a religious order had been carrying, exploded at the door of the courthouse, and the author of the attack was killed. A few days later President López returned, but did not resume office. Great public demonstrations asked for his return to the presidency, but he persisted in his intention to retire. So the campaign for the new presidential election got under way, an election which, in the case of López' retirement, was to be held 60 days after the resignation had been accepted. Lleras Restrepo, minister of finance, and Jorge Eliécer Gaitán, minister of labour, resigned from the cabinet in order to become candidates; at the same time the ambassador to Washington, Turbay, returned to explore the situation.

As Echandía was reforming the cabinet, he appointed General Espinel minister of war. Espinel was the foremost military man in the army, and had held high positions for a long time. In the army, subversive propaganda was still on the increase, and officers were holding clandestine meetings. The appointment of Espinel prevented a planned coup, but soon the plans of the conspiratory groups were being renewed. In May the Colombian Workers' federation declared a general strike of a few hours to ask for the return of López to the presidency. Eduardo Santos, president of the Liberal party, made the same request in the name of his followers, as did the parliamentary majority. When congress had been assembled President López presented his resignation, which was not accepted. He resumed his office and presented a program to parliament which included a new constitutional reform and labour and press laws. On July 10, 1944, when López was present at some military manoeuvres in southern Colombia, he was made a prisoner in the city of Pasto by the commander of the zone, who headed a subversive movement designed to set up a military regime in the country. The majority of the forces taking part in the manoeuvres obeyed the leaders of the revolution, who were under the direction of Col. Diógenes Gil. But Darío Echandía assumed the presidency in Bogotá, and with the aid of a group of generals and counting on the loyalty of the other military forces in the country, he succeeded in controlling the situation; at the same time the people rose with the intention of defeating the rebellion. The leaders of the revolution realized that they had failed and, except for the garrisons of Ibagué and Bucaramanga, surrendered to López after setting him free. López returned to Bogotá amid enormous manifestations of popular joy. The supreme court of justice, representing the judicial power, the council of state, the church, industry, banking, commerce, society and the labour unions had shown their loyalty to the civil government, and there did not appear to have been any connection between the military uprising and civilian groups and organizations. When the popular demonstrations started on July 10, Laureano Gómez took refuge in the Brazilian embassy, and left for Quito soon after; he returned in December. The state of siege proclaimed on the morning of July 10 was prolonged for the time in which the trials were held by military courts, and congress, which was to have met on July 20, adjourned itself for an indefinite period of time by majority decision. Because of the state of siege the government issued decrees which had the effectiveness of laws, dealing with labour,

minimum wages, strikes, military organization and the press, decrees which it had announced would be presented to congress as proposed laws.

Those involved in the military uprising were condemned to prison, the longest term being 10 years, with the exception of a captain who had killed the commander of his garrison, Col. Guarín, and was condemned to 25 years in prison.

Normal conditions had been restored by the time congress met on Nov. 10, and the government presented as proposed laws the decrees which it had issued previously. At the same time it insisted on a vast reform of the constitution which affected the judiciary and congress itself.

The promulgation of the decrees on social questions caused a serious disagreement between the parliamentary representatives and Eduardo Santos, who retired from the leadership of the Liberal party and went to the United States. Congress worked energetically, and the new laws were accepted without much opposition on the part of the Conservatives. The proposals for constitutional reform underwent the first regular debate and were then put off pending a second investigation by congress. Both houses were adjourned on Dec. 16, 1944.

They met again in Jan. 1945, called into extraordinary session by the president. In the chamber of representatives the commission, which at the request of the government had investigated the charges made against López by the Conservatives, presented a report invalidating those charges; the report was approved.

Alberto Lleras Camargo, who had been in charge of the ministry of government all this time, was nominated foreign minister and led to Mexico the Colombian delegation which proposed the bases for the Act of Chapultepec, adopted by the Pan American conference. The same minister went to the United Nations conference at San Francisco, at which Colombia distinguished itself through its efforts to consolidate regional organizations, as well as in defending the acceptance of Argentina as one of the United Nations, in opposition to the soviet union.

On March 10 a new subversive plan was discovered; a number of bombs were found in the cathedral of Bogotá. Eight days later the elections to the chamber and the assemblies went off peacefully, and brought a Liberal victory.

The electoral campaign for the presidency was about to begin. Turbay started it by resigning as ambassador to Washington and returning home; at the same time Jorge Eliécer Gaitán began his candidacy, under fire by the Conservatives, with violent attacks against the government, which he called "dictatory oligarchies," making his own slogan the "moral restoration of the Republic." Darío Echandía on the other hand also presented his candidacy, which was upheld by the Liberal groups supporting López and his policy.

In June 1945 the military prisoners who had participated in the conspiracy the year before staged a revolt in Bogotá prison and were subdued after a day of great alarm. Some days later demonstrations of students who called themselves anti-communists gave rise to new troubles which forced the government to issue a declaration saying that the public order had been disturbed, especially as new subversive activities had been discovered at the same time. Congress had been adjourned, but was called together again in June for an extraordinary session; before it President López insisted on his wish to resign his office.

In July 1945 the Liberal convention met and chose Gabriel Turbay as its candidate against the strong opposition of a group of delegates who supported the candida-

ture of Echandía; that group finally withdrew without acknowledging the wishes of the convention.

As soon as President López' decision to retire became known, members of parliament met to study the candidates for vice-president, and on July 27, Alberto Lleras Camargo was elected with the understanding that he would carry on the duties of the president until Aug. 7, 1946. On July 30 López presented his formal abdication which was accepted by the senate on Aug. 2. On Aug. 7 Lleras formally took over the presidency before congress, and made a speech in which he established the bases of agreement between the parties, and promised that the government would remain absolutely neutral in the presidential elections. Echandía, seeing that the Liberal party might loose the reins of government because of the split in its ranks, renounced his candidacy and asked Turbay and Gaitán to do the same. Neither of them agreed to the suggestion.

President Lleras offered the posts of minister of foreign affairs, finance and economy in his cabinet to three well-known Conservatives, who accepted them in spite of the official opposition of their party. A general atmosphere of good will and tranquillity established itself throughout the country. The government presented a law granting amnesty to the officers involved in the revolt at Pasto,

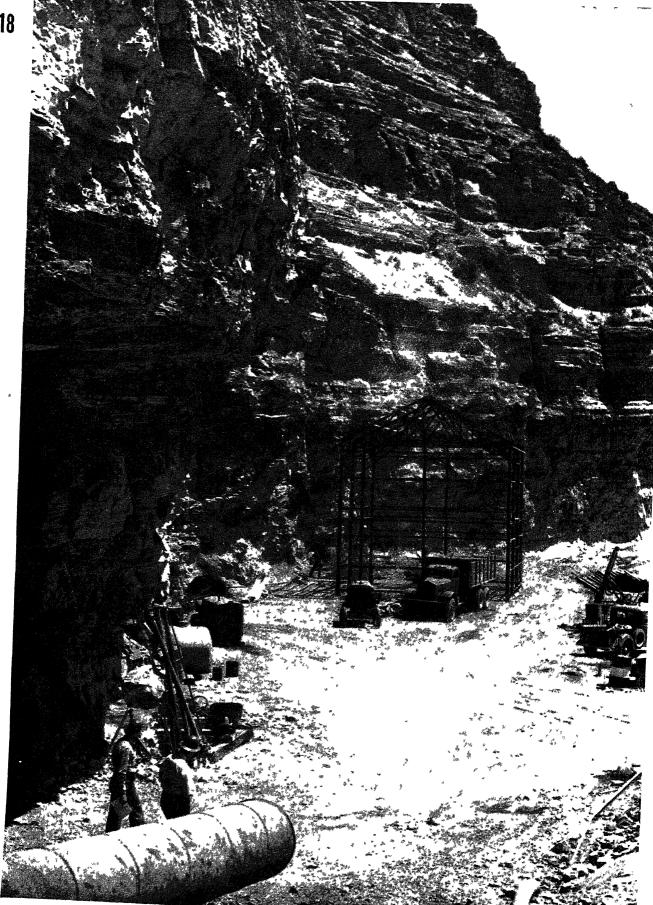
which was accepted after long debates. It also presented proposals for a reorganization of the administration, which, however, were not accepted by the legislature. In the course of the president's attempts to re-establish a normal state of affairs not only in the political, but also in the economic sphere, price control was abolished.

An attempt at a general strike was suppressed by the government without violence but with firmness, and soon thereafter an illegal transportation strike on the Magdalena river was prevented with the general approbation of public opinion.

The presidential campaign was being carried on intensely by the Liberals, and the Conservatives, encouraged by the guarantees given by the government at the elections of municipal councillors in October, decided at last to enter a candidate of their own in the struggle, when the division among the Liberals appeared irreparable, and several attempts had failed to make Turbay and Gaitán withdraw their candidacies.

Ospina's Election.—The presidential election of May 6, 1946, was carried out in complete tranquillity in spite of the vehemence of the campaign. All the parties gave full recognition to the fact that the government had guaran-

			nbia· Statistical Data			
ltem .	Value (000's omitted)	1938 Amount or Number	Value (000's omitted)	940 Amount or Number	Value (000's omitted)	Amount or Number
Exchange rate United States Great Britain		1 Peso = 55.9 cents 8.29 to 9.19 Pesos = £	21	1 Peso = 57 cents 6 Pesos =£1 (1941)		1 Peso = 57.2 cents 7 Pesos = £1 *
Finance Government revenues Government expenditures Gold reserves National debt	\$48,841 (£9,990) \$52,497 (£10,738) \$26,371 (£5,394) \$134,745 (£27,561)		\$52,340 (£13,666) \$52,340 (£13,666) \$24,866 (£6,492) \$100,315 (£26,192)		\$112,221 (£27,846)† \$113,600 (£26,189)† \$113,595 (£26,152)† \$182,230 (£45,162)†	
Transportation Railroads		1,933 mi. 4,114 ,, 5,433 ,, 9,280 ,,			•	2,083 mi.‡ 14,200 mi.‡ 5,433 mi.‡
Communication Telephones		39,283 22,188 mi. 42,000				47,219‡ 22,517 mi.‡ 175,000†
Minerals Petroleum		3,317,923 tons 520,717 oz. 29,460 oz.				2,053,396 tons† 565,501 oz.† 34,561 oz.†
Crops Corn		540,678 tons 294,975 ,, 259,702 ,, 100,089 ,,		708,901 tons 297,621 ,, 506,165 ,, 156,775 ,,		
Livestock Cattle		9,167,455§ 1,865,185§ 1,018,267§		10,442,000 1,200,000 1,040,000		
Forest Products Tannin		3,004 tons 217 " 68 " 1,564 tons				
Exports—total	\$80,702 (£16,507) \$49,599 (£10,145) \$20,787 (£4,252) \$4,963 (£1,015)	3,462,000 tons 280,000 tons 18,453,000 bbl. 215,000 tons	\$71,942 (£18,784) \$42,252 (£11,032) \$22,786 (£5,949) \$3,202 (£836)	3,936,000 tons 297,000 tons 22,426,000 bbl. 141,000 tons	\$130,085 (£32,239) \$94,351 (£23,383) \$21,372 (£5,297) \$285 (£71) \$100,035 (£24,792)	3,298,000 fons 328,000 ,, 18,561,000 bbl. 13,000 fons 406,331 fons
Imports—total	\$88,974 (£18,199) \$5,338 (£1,092) \$4,610 (£943) \$4,178 (£855)	450,607 tons 4,073 ,, 53,553 ,, 8,269 ,,	\$84,588 (£22,086) \$3,327 (£869) \$2,417 (£631) \$4,294 (£1,121)	2,909 tons 23,789 ,, 8,241 ,,	\$1,659 (£411) \$3,679 (£912) \$1,696 (£420)	714 ,, 30,302 ,, 2,947 ,,
Defense Standing army personnel Reserves	\$7,989 (£1,634)	14,812 50,000 1,320	•••	14,700 100,000 1,629 1,150		
Education Primary schools Enrolment Secondary schools Enrolment Normal schools Enrolment Special schools Enrolment Universities Enrolment		9,208 627,730 401 33,730 21 2,633 853 51,966	france of	9,901 685,317 776 58,980 8 3,713		
*1943 †1945.	‡1 <i>942</i> .	§1937. 1941.	¶Exports only.			



teed the exercise of the rights of all citizens and had kept strictest neutrality in the campaign. The three candidates, Turbay, Gaitán and Ospina Pérez, the latter Conservative, addressed themselves to the country from the presidential palace on the eve of the voting, asking their followers to respect the election fully and to abstain from any acts of violence. The results of the elections gave a relative majority to Mariano Ospina Perez, who obtained more than 500,000 votes, about 100,000 more than Turbay, while the smallest number went to Gaitán. The Liberal candidates together nevertheless obtained more than 800,000 votes.

The Liberals accepted their defeat without any intention to refuse recognition to the victory obtained by their adversary. On Aug. 7, 1946, President Ospina took office and set up a government of national union with an equal participation of Liberals and Conservatives in the cabinet and the departmental governments. Ospina Pérez began his term of office with a campaign to reduce the cost of living and to combat inflation. Congress with its Liberal majority offered to co-operate with the president.

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(AL. L.; X.)

Colorado

A Rocky mountain state in the west-central part of the U.S., Colorado is known as the "Centennial state," admitted to the union in 1876. Area 104,247 sq.mi., including 280 sq.mi. of water; mean elevation above sea level, 6,800 ft. Pop. (1940), 1,123,296; 52.6% urban, 47.4% rural; 93.6% native, 6.4% foreign-born; white 98.5%; Negro 1.1%. In 1944 the pop. was est. at 1,147,259. Capital and largest city, Denver (1940 census, 322,412, 1945 est. 392,412). Other cities: Pueblo (52,162); Colorado Springs (36,789); Greeley (15,995), Trinidad, Boulder, Grand Junction and Fort Collins, 12,000 to 15,000.

In 1937 principal state officers were: governor, Teller Ammons; attorney general, Byron G. Rogers; heutenant governor, Frank J. Hayes; secretary of state, George E. Saunders. A congressional appropriation for \$900,000 was approved for the beginning of a power and irrigation project in the state. The project, called the Colorado-Big Thompson Diversion, involved the transfer of water from the western slope through the continental divide onto the plains of northern Colorado.

Before the November election in 1938, the state had been overwhelmingly Democratic. In that election a Republican governor was elected by a plurality of 40,000 votes. The state officers elected were: governor, Ralph L. Carr; lieutenant governor, John C. Vivian; secretary of state, George E. Saunders; auditor, Homer F. Bedford; treasurer, Charles M. Armstrong; attorney general, Byron G. Rogers; superintendent of public instruction, Mrs. Inez Johnson Lewis.

The most important legislative action of the 32nd general assembly in 1939 was the diversion of certain in-

Colorado mountainside, rich in oil shale, where the U.S. bureau of mines began work in 1946 on a demonstration plant designed to serve as a pilot for the mining of shale. Deposits in Colorado, Utah and Wyoming were estimated as sufficient to supply U.S. fuel needs for 68 years

come tax receipts, which formerly were devoted to the school fund, into the state general fund to meet expenditures of the public assistance program. In the presidential election in 1940, tabulation of returns for Colorado showed 278,855 votes for Willkie and 265,364 for Roosevelt.

(E. D. F.

	Tabi	e I —Educ	ation (Publ	ic)		
	193	8 19	40 1	942	1943	1944
Elementary pupils High school pupils	. 172 7 . 54,4	75 171 62 55	,004)	25,967 {1	40,085 47,345	138,012 44,594
Elementary teachers . High school teachers .	3,1	00 5 48 3	$\binom{722}{447}$ 1	0,214	7,177	8,710
	Tabie	e II —Publi	c Welfare			
(All	l money fig	jures in the	ousands of	dollars)		
	1938	1940	1941	1942	1943	1944
Cases on general relief Cost of general relief. Recipients of old-age	12,900 \$195	13,379 \$186	10,01 3 \$142	12,075	5,779	
pensions	37,650	41,152	42,551	42,676	41,601	40,787
Dependent children re-	\$1,129	\$3,630	\$1,438			
Blind receiving aid Workers under unem-	10,020 623	14,506 640	15,572 607	5,734 637	4,124 586	9,041 50 3
ployment compensa-	136,886	128,400	300,000	350,000		225,000
	Table	III —Comr	nunications	:		
	1938	1939	1940	1942	1944	1945
State highway mileage Railroad mileage	. 12,253 . 4,641			12,390 4,507	12,397 4,50 7	12,399 3,883

In the 1942 elections the following state officers were elected: governor, John C. Vivian, heutenant governor, William E. Higby; secretary of state, Walter F. Morrison; auditor, James L. Bradley; treasurer, Leon E. Lavington; attoiney general, Gail L. Ireland, superintendent of public instruction, Mrs. Inez Johnson Lewis. Robert F. Rockwell (Rep.) was re-elected in 1942 as congressman for the fourth district, and Eugene D. Millikin (Rep.), appointed by the governor to succeed Sen. Alva B. Adams until the election, was elected for the remainder of the unexpired term. Chief Justice John C. Young, by right of seniority in office, became chief justice of the state supreme court. Justices William S. Jackson and Frank B. Goudy, previously appointed, were elected to fill out unexpired terms.

In 1943 Walter F. Morrison resigned as secretary of state, and L. J. Bennett was appointed for the unexpired term. In the 1944 state elections John C. Vivian was reelected governor. Other officers chosen were: lieutenant governor, William E. Higby; treasurer, Homer F. Bedford; secretary of state, Walter F. Morrison; auditor, Leon F. Lavington; attorney general, H. Lawrence Hinkley; superintendent of public instruction, Inez Johnson Lewis. Two extra sessions were held by the 34th general assembly during 1944. In the first the election laws were amended to permit servicemen to vote in the general elections, and the second voted down a measure which would prohibit alien Japanese from owning property in the state. In the 1944 presidential election, Dewey received 268,731 votes and Roosevelt 234,331.

The regular 1945 session of the 35th general assembly repealed the state service tax and enacted a budget law for local governments, passed an occupational disease law, established a state institutional board and created a fund of \$100,000 for industrial research. In a special session the state planning commission was authorized to rehabilitate three state institutions, a state aeronautics commission was established and money was appropriated for highway expenditure.

No regular legislative session was held in 1946. In the November elections of that year, the following state offi-

cers were chosen: governor William Lee Knous (Dem); lieutenant governor, Homer Pearson (Rep.); secretary of state, Walter F. Morrison (Rep.); treasurer, H. Rodney Anderson (Rep); auditor, Homer F. Bedford (Dem.); attorney general, H. Lawrence Hinkley (Rep.); superintendent of public schools, Nettie Fried (Rep.); representatives, John A. Carroll (Dem.); William S. Hıll (Rep.); Robert F. Rockwell (Rep.); J. Edgar Chenowith (Rep.).

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			V.—Banking ai				
	193 <i>7</i>	1938	1939	1940	1942	1943	1944
State revenue State expenditure	\$40,683 \$31,273	\$49,255 \$54,019	\$52,216 \$38,678	\$39,826			
Number of banks	149	145	144 \$325,200	146 \$342,900			
Total deposits No. of national banks	\$319,700 78	\$302,600 78	\$3.23,200 78	78	7:		
			ble V.—Agricu				
			figures in thou		1011	1040	1045/
		1937	1939	1940	1941	1943	1945(est)
Total acreage, principal crops income, crops and livestock.		5,225 \$142,400	5,045 \$110,200	5,559 \$132,626	6,140 \$157,99		5,948 \$
Leading crops (bu)		8,772	7,956	9,368	15,37		19,551
Corn		8,536	8,043	10,656	15,02 1,87		16,588 1,818
Hay (tons)		1,661 4,433	1,542 4,205	1,684 4,530	5,85		7,245
Potatoes		15,688	14,400	15,210	11,96	18,531	19,110
Sorghum		1,521	2,363 1,543	5,000 2,092	5,73: 1,90		2,759 1,836
Sugar beets (short tons) Wheat		1,992 15,155	12,965	13,560	25,03		
		T., b.(a	· VI.—Manufac	rium a			
			res in thousand				
		1937	1939	1941	1943	1944	1945
		31,129	27.893	40.493	67.233		55.665
Persons employed Value of products		\$237,838	\$221,643	\$310,000	\$410,000		\$400,000
		Table V	II.—Mıneral Pr	oduction			
		(All figure	s in thousands	of dollars)			
	1937	1938	1939	1941	1942	1943	1944
Total value of products Leading products	\$67,339	\$60,369	\$64,072	\$70,000 (est.	•	\$80,000 (est)	\$70,000 (est)
Coal	\$18,327	\$14,828	\$14,548	\$18,416	\$25,615	\$27,039	\$28,791
Gold	12,912 4,843	12,861 5,128	12,840 5,767	13,301 5,192	9,402 2,202	4,81 <i>5</i> 1,895	3,900 1,599
Copper	2,646	2,778	2,749	1,593	267	267	283
Petroleum	1,800	1,540	1,330	2,338	2,520	3,400	3,380
Lead				1,433	2,034 27.750	2,705 45,000	2,832
Zinc				2,358	5,992	9,524	9,110

Colour Photography

See MOTION PICTURES; PHOTOGRAPHY.

Colour Printing

See Printing.

Columbia, District of

See Washington, D.C.

Columbium

There was no production of columbium ores as such in the United States during 1940–42, though small amounts were recovered as a by-product from tantalum ores, and there had been small outputs previous to 1940. Production in 1943 was only 5,771 lb., declining to 3,208 lb. in 1944 and 1,149 lb. in 1945. Imports, however, were in considerable amounts beginning in 1933. In 1937, imports were 461 short tons, declining to 55 tons in 1939, followed by steady increases to a high of 2,138 tons in 1945.

About 99% of the total imports came from Nigeria, but small shipments were received from South Africa, Uganda, India, Belgian Congo and Brazil.

Although metallic columbium had been on the market for a number of years, with little demand, the first extensive commercial application came in 1933, with the discovery that a small addition of ferrocolumbium to stainless steel was a remedy for intergranular corrosion at high temperatures. Although this use was well developed in prewar years, it found new applications in specific war uses, especially in turbo-superchargers for aeroplane engines, and in gas turbines and jet-propulsion motors.

(G. A. Ro.)

Combined Chiefs of Staff

See CHIEFS OF STAFF, COMBINED AND JOINT.

Combined War Boards, British-U.S.

See British-U.S. War Boards.

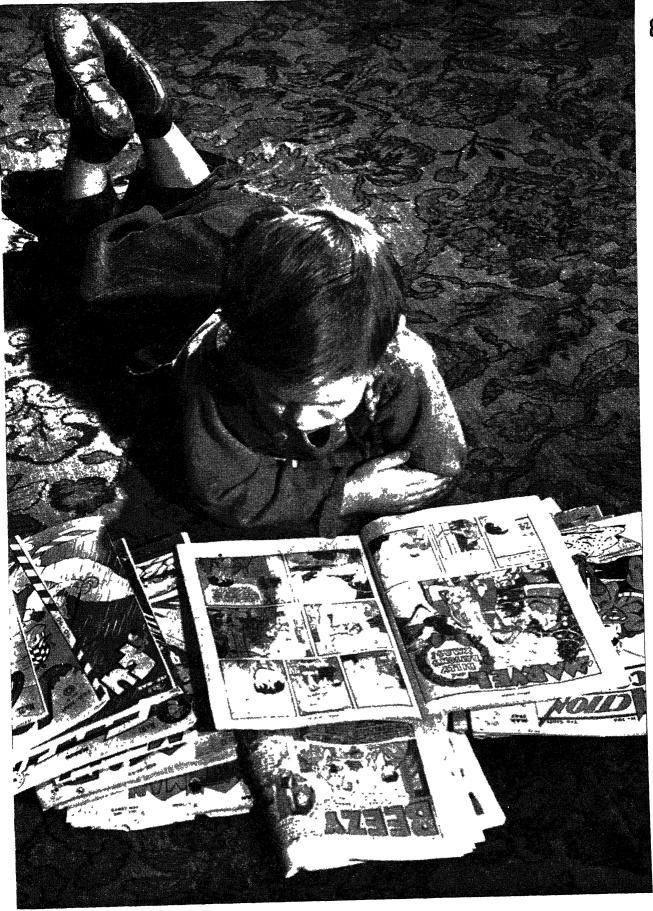
Comets

See Astronomy.

Comic Strips

The humour of the U.S. comic strip in 1937 was hard to find. Beginning as a simple series of panels, usually four, running lengthwise, telling a simple episode in the life of (usually) some well-meaning, ludicrous-looking simpleton and ending with a "Bam!!!" or "Zowie!!!!" denoting violent, painful or comic frustration, the comic strip by 1937 had undergone a drastic change. The clowns had been pushed off the comic page by the misery-vendors, the horror-vendors, the blood-merchants. The hilarious "Bam!!!" or "Zowie!!!!" ending of the comic simpleton overcome by the brutality, misunderstanding, avariciousness or bad temper of his fellowman, had been supplanted by the "Help!! The rattlesnake is strangling me, Mother, dear!!!"-or-"Take dat, you copper-right t'roo de head!!!" type of ending wherein the comic simpleton was supplanted by a pathetic, golden-haired little girl simpleton or a blue-eyed, white-lipped, red-blooded detective simpleton, whose perils never ended-in fact, increased each day in violence and intricacy.

This was called the suspense ending, a trick borrowed from the oldtime serial movie of the *Perils of Pauline* school. However, whereas in the serial movie, the threats to the life or purity of the hero or heroine were in the final episode happily overcome, the honour of Dick Tracy and Jane Arden of the comic strips was in as much danger in 1946 as it was in 1937. By that time the



comic strips, with a few die-hard, hard-fighting exceptions, were no longer comic.

A few years before, the discovery had been made by Sidney Smith in "The Gumps" and by Vic Forsyte in "Joe Jinks," that if the cartoonist worried a reader half to death about the fate of his favourite comic-strip character, he'd be sure to buy that newspaper the next day to find out what happened. This made for much greater circulation figures than did the comic strip in which the reader left his favourite comic-strip character with a happy carefree laugh and no worries. The word went out from circulation departments that anxiety about the fate of Orphan Annie's dog sold far more papers than did joy over the foolishness of Boob McNutt. Therefore, out of newspapers went the great masters of comedy-Rube Goldberg ("Boob McNutt"), Milt Gross ("Nize Baby"), Maurice Ketten ("Can You Beat It"), Hoban ("Jerry on the Job"), Fred Opper ("Happy Hooligan"). Editors demanded blood, horror, violence, tear-jerking. In came the masters of the suspense comic strip-Harold Gray ("Orphan Annie"), Chester Gould ("Dick Tracy"), Milton Caniff ("Terry" and "Steve Canyon"), Alex Raymond ("Flash Gordon"), Zack Mosely ("Smilin' Jack"), Barrett and Ross ("Jane Arden"), Seigal and Shuster ("Superman"), Darrell Maclure ("Annie Rooney"), Lee Falk ("The Phantom").

A handful of the really comic, comic artists survived, even strengthened their places in public favour, by combining the old humour with the new suspense. Most spectacularly successful was Segar, whose "Thimble Theatre," a joke-a-day strip, became "Popeye," a masterly combination of rough-and-ready gag humour and tongue-in-cheek melodrama, and was during its creator's lifetime the most popular comic strip in the world. On the other hand, Bud Fisher, whose "Mutt and Jeff" was rated as one of the top comic strips for many years, refused to alter his joke-a-day formula and was partially, but not entirely, eclipsed by the blood-and-thunder boys. Chic Young, whose "Blondie" was, in its beginnings, a joke a day about a pretty girl and her beaus, saw the handwriting on the wall and created his own inimitable combination of gags and continued story. "Blondie" still had a joke a day, and very good jokes they were, but there was added a strong background story line-in the day-to-day growth of the children in the strip; the day-to-day change in the type of perplexing domestic, social and financial problems confronting its adult characters; in the continuity of its family and community relationships.

George MacManus ("Bringing up Father"), like Bud Fisher, refused to change his formula but survived. With these few exceptions, however, the trend away from happygo-lucky comedy had by 1937 completely changed the appearance and the flavour of the comic page. The charming if sometimes crude and simple comic drawings of Rube Goldberg and Maurice Ketten were supplanted by realistic illustration, some of it excellent, such as the magnificent pen drawings of Frank Godwin ("Connie"); the brutal power of Chester Gould's drawings for his "Dick Tracy"; the warm realism of Raeburn Van Buren's "Abbie an' Slats"; the superb smashing draftsmanship and lush colour of Milton Caniff.¹

The increasing importance of the comic strip and the increasing publicity given to its financial rewards began, in the late '30s and early '40s, to attract America's top illustrators and writers. Polls began to indicate that comic

strips were not read exclusively by children, that at least half of U.S. adults by 1940 were comic-strip devotees. Advertisers began to discover that comic-strip advertising was more effective than any other type. The U.S. Army War college discovered that the comic strip was a most effective medium of educating soldiers in such various subjects as the perils of venereal disease, the traditions behind and reasons for the military salute, the advantages of voluntary branches of service (such as in the army-distributed "Private Li'l Abner, U.S.A." series issued by the visual-aids section of the Army War college). Newspaper polls indicated that an increasing majority of newspaper readers' selection of newspapers was determined by comic strips. A Boston Globe poll taken of a Boston college early in 1947 showed that the comic page was the deciding factor in the choice of a local newspaper for 93% of those inter-

During World War II, and in the postwar period of 1945-46, comic-strip creators began to realize the power and influence of the comic strip. The daily devotion of 30,000,000-40,000,000 readers which could make a catchphrase in any of the popular comic strips a part of the American language overnight began to be used by comicstrip creators for more socially-conscious purposes. Harold Gray ("Orphan Annie") frequently expressed the political views of his employer, the Chicago Tribune syndicate, via his more attractive characters and the opposing points of view via his more repulsive, unsanitary characters; Milt Caniff had sharp comments on army brass, army red tape, in his wartime strips; Raeburn Van Buren's "Abbie an' Slats" frequently made strong story-pleas for goodwill among men of all faiths; H. T. Webster's cartoons launched a relentless and effective campaign against the overcommercialism of radio and were influential in forcing changes; Seigal and Shuster's hero, "Superman," constantly fought the real-life villain's bigotry, intolerance, racehatred; Crockett Johnson's "Barnaby" poked literate fun at extreme reaction. The comic strip during the decade 1937-46 became, in terms of the constancy of the devotion of its followers, the most popular U.S. entertainment, surpassing radio and the motion picture. See also Cartoons; Humour, War.) . (A. Cp.)

Comintern

See Union of Soviet Socialist Republics.

Commandos, British

The British commandos were special troops, designed originally to take part in light amphibious raids, who played a dramatic and adventurous role in World War II and whose courage and physical fitness became proverbial. They were first raised when Britain's fortunes were at their lowest cbb; they remained and survived to share in the final victories. After the withdrawal of the British expeditionary force from France in June 1940, the whole attention of the German high command was directed toward the defeat of England. It was clear at that time that if any threat, however slight, could be brought against the long axis front line from Narvik to Biarritz, the Wehrmacht would be forced, in the midst of invasion preparations, to organize some form of a defense system. At the same time, it was vital to maintain the offensive spirit in the British army. Accordingly, in July 1940, the commandos were formed.

The commandos were raised from officers and men in the army who volunteered for independent mobile operations. There were originally ten commando units, each just over 500 strong, organized into a headquarters and



Right: Under cover of smoke screens, British commandos are shown attacking a German garrison and supply dump at Maaloey Island on the coast of Norway, Nov. 27, 1941



Left: Oil storage wells burning at Stansund, Norway, during one of two British commando raids on the Lofoten Islands in 1941. In addition to the destruction of German matériel and the capture of nazi prisoners, many Norwegians were brought back from these raids to take part in Allied operations





Above: Returning commandos who took part in the large-scale raid on Dieppe, Aug. 19, 1942. Almost half the attacking force was lost

Left: Lord Louis Mountbatten reviewing a unit ready to depart for a night raid

ten troops. Two of the original units were formed from men who had already served in the independent companies. The organization was changed from time to time, as operational experience was gained, and at the end of the war, a commando unit consisted of a headquarters, five troops and a heavy weapons troop, totalling approximately 450 men. In the early days the commandos were not brigaded, and each unit came under the direct orders of the war office; but in Nov. 1940, the commandos were reorganized into the special service brigade. This was commanded and trained until 1942 by Brigadier J. C. Haydon, who laid the foundations of the commandos' successes. He was succeeded by Col. (later Maj. Gen.) R. E. Laycock, appointed chief of combined operations.

At various stages of the war, other specialized units were formed, and became part of the special service brigade. Among these were a special boat section and an Allied commando. The latter unit comprised a British head-quarters, two French troops, one troop each from Poland, Belgium, Norway and Holland, and a troop manned by German and Austrian aliens. In Sept. 1943, the amalgamation of the royal marine division and the special service brigade took place. Finally, in 1944, the commando group emerged.

This formation, approximately half army and half royal marines, consisted of a group headquarters, four commando brigades, a holding commando, an engineer commando, a commando basic training centre and a commando mountain warfare training centre. The last-named establishment trained men in the technique of cliff assaults, and rock and surf landings.

The commandos took part in every major operation from their inception till the end of the war. In the earlier days they were employed in small raids, carried out by individual troops, although there were several occasions on which complete units were involved. Examples of these were Vaagsö, St. Nazaire, Dieppe, North Africa, Madagascar, the middle east, including Crete and Syria, and the invasion of Sicily and Italy.

Further operations were undertaken by the commandos in the invasion of Normandy; two special service brigades landed on the first day. The 1st brigade operated with the 6th air-borne division on the left flank of the beachhead, and subsequently assumed a mobile role when the advance inland began. Later, in Jan. 1945, the brigade took a leading part in the crossing of the rivers Rhine, Weser, Aler and Elbe. The 4th brigade fought in several operations, including the capture of Port-en-Bessin, but did not fight as a brigade till six days after the initial landing. Subsequently, it took part in the pursuit to the Seine, was concerned in the capture of Le Havre, invested Dunkirk and played a prominent part in the capture of Walcheren. At the same time, two other brigades were on active service, one in Italy and the other in southeast Asia. In the far east, the 3rd commando brigade helped in the capture of Akyab, took the Myebon peninsula and, at Kangaw, bore the brunt of the decisive battle for

Some indication of the worth of the commandos may be gathered from the fact that, out of 178 V.C.'s won during the war, no fewer than 7 were awarded to commandos. Of these, perhaps the two most notable recipients were: Lt. Col. Geoffrey Keyes, V.C., who received his decoration posthumously for leading the famous raid on Field Marshal Rommel's headquarters in North Africa in Nov. 1941; and Lt. Col. A. C. Newman, V.C., who com-

manded the troops in the St. Nazaire operation earlier in the same year. (See also Tactics of World War II; World War II.)

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Commerce

See Business Review; International Trade; see also under separate countries.

Commerce, U.S. Department of

See GOVERNMENT DEPARTMENTS AND BUREAUS.

Commerce Commission, Interstate

See Interstate Commerce Commission.

Commission on a Just and Durable Peace

The Commission on a Just and Durable Peace was instituted by the Federal Council of the Churches of Christ in America in Dec. 1940, as a means to focus the efforts of Protestant and Orthodox churchmen in the United States on critical emerging issues of world order. The commission's Committee of Direction, under the chairmanship of John Foster Dulles, was elected by the council in March 1941, and five interdenominational bodies were invited to appoint representatives to the commission. A series of studies was initiated, leading to the formulation of 12 "Guiding Principles" and the calling of a National Study Conference on the Churches and World Order at Delaware, O., in April 1942.

On the basis of the "Guiding Principles" and the Delaware conference findings, the commission prepared in the spring of 1943 a statement of political propositions, known as the "Six Pillars of Peace." This statement, which called for international organization to provide for the "continued collaboration of the United Nations," laid the groundwork for an intensive educational campaign in the churches under the sponsorship of the commission.

A second National Study conference was convened at Cleveland, O., in Jan. 1945, at which representative leaders of the Protestant and Orthodox communions agreed upon nine constructive recommendations for the improvement of the Dumbarton Oaks proposals. These recommendations were studied widely, and the majority were incorporated in substance in the charter of the United Nations.

In Nov. 1945, the commission met to formulate a general postwar strategy for the churches, entitled "Christian Action on Four Fronts for Peace." The commission was subsequently asked to do the preparatory work for a special statement entitled "The Churches and World Order." adopted by the Federal Council of Churches in March 1946, and for the first international church conference on world order after the end of World War II, held at Cambridge, England, in Aug. 1946. (Ri. M. F.)

Committee for Economic Development

The Committee for Economic Development was organized in Sept. 1942, by a group of U.S. business leaders who recognized that the maintaining of high employment would be a critical peacetime problem; that large-scale unemployment would carry hazards for democracy and for a free enterprise economy.

They were convinced that the continuance of high employment after World War II could not and need not be left to chance. They foresaw an opportunity to achieve unprecedented peacetime prosperity if business were ready

to swing rapidly to peacetime production at the war's end and the government were prepared with policies and measures that would assist the reconversion and contribute to maintaining high production.

A plan was drawn up, therefore, with two major objectives: (1) To help businessmen plan for quick reconversion and expanding production, distribution and employment after victory, and (2) through objective research help determine business and public policies that would contribute to the attainment and maintenance of high production and employment.

To carry out the first assignment, a Field Development division was organized. Local C.E.D. committees were set up in communities of 10,000 and over, and in many smaller places. A total of some 2,000 committees, with more than 70,000 businessmen serving in the local groups, worked at the task of contacting the nation's industrial and business employers, from the corner grocers to the largest manufacturers. They took to these employers carefully documented information indicating what postwar markets offered for production and jobs.

To aid business in planning expanded production and employment at the end of the war—a date that was to prove to be three years' distant—specialists in industrial management, in product design, in advertising and selling, and in training of sales personnel prepared handbooks, films, training courses, business clinics, and through these placed their skills, without cost, at the service of all co-operating businessmen.

At V-J day, against the rising tide of predictions of "8,000,000 to 10,000,000 unemployed by Christmas," the C.E.D. announced—on the basis of local reports from every part of the country—that there would be no serious unemployment in the first year of peace. The ensuing months bore out this statement. Its wartime "plan jobs" assignment concluded, the Field Development division was discontinued early in 1946.

On its assignment of determining the economic policies that would contribute to high employment, ten research studies and three supplementary research papers had been completed by independent economists for the research division late in 1946. Of the ten studies, five dealt with transition period problems; as follows: liquidation of war production, demobilization of wartime economic controls, providing for unemployed workers in the transition period, financing of business during the transition, and jobs and markets.

The other five previously issued considered the longer range problems: production, jobs and taxes, postwar taxation and economic progress, international trade and domestic employment, agriculture in an unstable economy, and control of world trade—cartels and commodity agreements.

Ten policy statements stemming from these studies were issued by the Research and Policy committee of businessmen, as follows:

Postwar Employment and the Settlement of Terminated War Contracts (Oct. 1943).

Postwar Employment and the Liquidation of War Produc-

tion (July 1944). Postwar Federal Tax Plan for High Employment (Sept.

1944).
Postwar Employment and the Removal of Wartime Controls

(April 1945).
International Trade; Foreign Investment and Domestic Em-

ployment (May 1945).
The Problem of Changeover Unemployment (Aug. 1945).
Toward More Production, More Jobs and More Freedom (Nov. 1945).

Agriculture in An Expanding Economy (Dec. 1945). The End of Price Control—How and When? (April 1946). Fiscal Policy to Fight Inflation (Sept. 1946). Until sound policies became a part of the day-to-day thinking of the groups and the individuals concerned, they were of little practical purport. Recognizing this, the C.E.D. board of trustees in 1946 was increased to include 100 leading businessmen and educators from all parts of the country. A national C.E.D. Information committee was authorized to carry forward an educational program through membership and local C.E.D. Advisory councils and through the daily press and periodicals. Every effort was to be made to provide the interested citizen with the findings and recommendations stemming from the C.E.D. research program.

Studies under way at the end of 1946 included such major problems as fiscal and monetary policy to combat inflation; practices and policies in labour-management relationships to foster increasing productivity and industrial peace; and ways of strengthening the small business sector in the economy.

The businessmen heading the various divisions of C.E.D work at the end of 1946 were Paul G. Hoffman, president, Studebaker corporation, chairman of C.E.D.; Ralph E. Flanders, chairman of the board, Jones & Lamson Machine company, chairman of C.E.D. Research division; Walter D. Fuller, president, Curtis Publishing company, chairman, Information division; Marion B. Folsom, treasurer, Eastman Kodak company, chairman of Field Development division, later succeeded by Walter D. Fuller.

The C.E.D., a private, nonprofit, nonpolitical association with headquarters in New York city, continued to be supported by contributions from businessmen throughout the country.

(P. G. H.)

Commodity Credit Corporation

During the ten years 1937–46 the Commodity Credit corporation was the United States government agency which financed the prewar stock-piling of agricultural commodities, the wartime expansion of food production and the immediate postwar acquisition of food and fibres for export to Europe and Asia.

The CCC was created in 1933 to make commodity loans to farmers in helping stabilize the prices of farm products. In 1938 its activities were integrated with domestic agricultural adjustment and conservation programs. In 1941 the corporation undertook (1) to stimulate the wartime production of farm products by guaranteeing minimum prices to farmers in consideration for increased production, and (2) to finance through a revolving fund the purchase of agricultural products for lend-lease to Great Britain and its war Allies.

A large wartime expansion was promoted in U.S. production of crops and livestock products—vegetable oils, meats, milk, dry beans and eggs. The volume of agricultural food production was increased in 1941 to 115% of the 1935–39 prewar average; in 1942 the total was 125% of the prewar average. In addition, large quantities of foreign agricultural commodities, principally vegetable oils and oil-bearing seeds from Latin America, were bought by CCC to supplement domestic supplies and exports of food to war allies.

These wartime programs of the CCC were integrated with domestic price stabilization designed to hold down the cost of living and the cost of the war. Where the support prices to farmers (to encourage increased production) exceeded the ceiling prices established by the federal government, the differences were paid as subsidies to proc-

essors and dealers. Special payments were also made direct to dairy farmers to help offset their increased production costs. Government supplies of feed wheat were sold to farmers, below cost, to stimulate the production of livestock products beyond the availability of feed grains.

Continuing emphasis was put upon greater agricultural production and the output of food increased despite the wartime restrictions that had been placed upon the manufacture of agricultural machinery and the marked wartime reduction made in the number of farm workers. Outstanding were the increases in production of meats, milk, eggs and vegetable oils. In 1943 the total production of food was increased to 133% of the prewar average. In 1944 the volume was increased to 138% and in 1945, the last year of the war, the production volume was maintained at 137% of the prewar average.

During the World War II period, CCC purchases of commodities for lend-lease totalled nearly \$6,000,000,000. Subsidy payments to stimulate agricultural production totalled \$1,380,600,000. Loans to farmers on crops during this four-year period totalled approximately \$2,467,000,000. To engage in these large operations, the CCC was continued and its borrowing power increased from time to time from \$1,400,000,000 in 1940 to \$4,750,000,000 in 1945.

Anticipating the problems of postwar agricultural adjustment to peacetime needs, the congress had also authorized the CCC to support at specified rates the farm prices of basic and nonbasic commodities for two years after the war. Subsidy programs also were continued, but on a reduced scale in 1946. To meet immediate postwar domestic and foreign needs for food, the agricultural production volume was maintained in 1946 at approximately 133% of the prewar level.

In 1946 the corporation supported postwar prices to farmers through commodity loans and purchases and continued financial assistance in the stabilization of food prices. After 1933 the corporation loans to farmers had totalled approximately \$5,000,000,000, of which \$100,000,000 was outstanding on June 30, 1946. On that date the corporation owned commodities valued at about \$500,000,000.

Commodity Prices

See AGRICULTURE; BUSINESS REVIEW; PRICES.

Commons, House of

See Parliament, Houses of.

Commonwealth Fund, The

See Societies and Associations.

Communications Commission, Federal

See Federal Communications Commission.

Communism

Communism, or revolutionary Marxism, is a system of government and a totalitarian way of life evolved under the leadership of Nicolai Lenin and Joseph Stalin in the soviet union, the former Russian empire. Under Lenin it originally regarded the Russian revolution only as the starting point for a communist world revolution. But the failure of the world proletariat to follow Moscow's call in the years after 1917 led to a change of emphasis and direction in communism under Stalin. Much greater stress was put on Russia as the only genuine leader and representative of communism. Thus the movement presented during

the ten eventful years, 1937-46, an amalgam of Lenin's world revolutionary communism with the historical traditions and aspirations of the Russian empire and of the Russian people. Communism had shown itself the new form in which these aspirations had vitalized and organized the masses of the empire to active participation. Within this framework communist policy underwent several fundamental and sometimes sudden changes during the ten eventful years, according to the true or supposed needs of communist success and Russian interests. The flexibility of soviet policy was perhaps enhanced by the ruthless 'purges" of 1936-38, in which Stalin eliminated all those persons, many of them among the oldest and most renowned communists and closest collaborators of Lenin, who could endanger his undisputed and unquestioned leadership. In this process several hundred thousand communists and leading personalities of the political, economic and military life of the soviet union were "liquidated" as "traitors" or "enemies of the people."

This flexibility in policy, though not in communist principles, methods or goals, showed itself in the sudden change of the "general line" in Aug. 1939 when the soviet union abandoned the principle of collaboration with the democratic nations in the struggle against fascism, and lined up side by side with aggressive fascism, which communists had proclaimed until then the mortal enemy of the proletariat, of peace and progress. Until June 1941, communists everywhere played a rather ambiguous role; nevertheless they directed all their main attacks against democracy, against Great Britain's efforts to resist fascist aggression, and against the defense program of other democracies, including the United States, to prepare themselves against fascist aggression. Communist parties throughout the world adapted themselves to the new line in complete disregard of the national interests of the country in which they were living. The parties in France and Great Britain vilified and tried to hinder the war efforts of their countries in the fight against fascist aggression. The French government had to dissolve the French Communist party under the leadership of Maurice Thorez, who deserted the French army and fled to Russia. The British government did not take any special measures against the rather unimportant party in Britain but had to suspend publication of the Daily Worker on Jan. 21, 1941, because it systematically published matter "calculated to foment opposition to the prosecution of the war to a successful issue."

In the U.S. the Communist party from Aug. 1939 to June 1941 was one of the chief agents against help to the democracies resisting fascist aggression and against America's preparation for the eventuality of war. In 1939 Earl Browder, general secretary of the party, claimed for it a membership of 100,000, of whom one-third resided in New York state. In the U.S. national elections of Nov. 1940, Browder was the party's presidential candidate and James W. Ford, a Negro leader from New York, ran for vicepresident. They polled 48,789 votes (as against 80,159 in 1936 and 102,991 in 1932). But the party was barred in some important states (New York and Illinois) from the polls and failed in others, such as Ohio, to qualify by securing the required number of petitions. The largest number of votes went to communist candidates in California (13,586), New Jersey (8,814) and Pennsylvania (4,519).

The attitude of sympathy toward Germany and of obstruction to the fight against fascism changed completely with the German attack on the soviet union on June 22, 1941. The shift in communist policy, both in the soviet union and abroad, was as sudden and complete as it had

been in Aug. 1939. The soviet union resisted with utmost heroism and bitterness the German onslaught and, as a result of 25 years, of psychological and material preparation for war, showed itself much better prepared than many observers had believed possible. Marshal Stalin, in his speech of July 3, 1941, after rather futile and unconvincing efforts to defend the policy of isolationism and neutrality, proclaimed that "our war for the freedom of our country will merge with the struggle of the peoples of Europe and America (the United States was not yet at war) for their independence, for democratic liberties."

The German government tried to proclaim its war for the conquest of eastern Europe a crusade on behalf of European civilization and of Christianity against a godless and barbaric communism. Hitler's interpretation of his war against the U.S.S.R., after his two years of studied silence about the dangers of communism and of emphasized friendliness toward the soviet union, was repudiated everywhere. The democracies, though maintaining their uncompromising antagonism to communism, regarded the people and the armies of the soviet union as united with them in a common effort to defend all peoples against subjugation by Germany and Japan and inclusion into the National Socialist world order.

With the existence of the soviet union at stake, communists everywhere suddenly saw the war in an entirely different light and became the most determined proponents of relentless war against Germany. This attitude culminated in their propaganda for a second front in western Europe to relieve the pressure on the soviet union, irrespective of the state of preparation of the democracies for such an unprecedented invasion and of their involvement and obligations elsewhere. As the soviet union was at peace with Japan, no demand was raised by communists anywhere (outside China) for a fight against Japanese fascism. All considerations centred for the communists around the national existence and interests of the soviet union, not around any principle of an international struggle against fascism. The love of the soviet union and the admiration for its system inspired not only the Russian people but communists everywhere, especially in the occupied countries of Europe, to heroic resistance.

Shift to Nationalism.—In the soviet union the national patriotic trend which had been visible already in the preceding years became more and more pronounced. Stalin himself took the lead in a message to the Russian people on July 30, 1942. He called upon them to be inspired in this war by "the daring spirit of our great ancestors," and he set as examples heroes of Russia's feudal past, like Alexander Nevsky, who defeated the Teutonic knights in 1242 and was canonized by the Orthodox church; Dmitri Donskoi, who annexed Rostov to Russia in 1380; Prince Pojarsky, who drove the Poles out of Moscow in 1612 and set the Romanoff dynasty on the Russian throne; General Suvorov, who led the Tsar's armies victoriously in the second half of the 18th century; and General Kutusov, who defeated Napoleon. This invocation of the heroic past filled the soviet youth with a deeply national spirit, fundamentally different from the international proletarian spirit prevailing in the first years of the Russian revolution, in which the whole Russian past had been viewed with indifference and even hostility. Heroes of past Russian wars were as much celebrated as the soldiers and guerrillas of World War II. Literature and the theatre, the movies, radio, sculpture and music celebrated them. Kosta Simonov glorified them in his melodrama The Russian People; Dmitri Shostakovich wrote in their spirit his seventh symphony, Serge Prokofiev his Symphonic Suite 1941

and his opera War and Peace, Ivan Dzerzhinsky his opera Blood of the People, and Victor Byely the choral music of "Song of Wrath." Even such tyrants as Tsar Ivan the Terrible became figures of official adulation. It was a strange fact that in spite of his tyranny, Ivan was presented as a favourite of the Russian masses. In 1944 Alexei Tolstoy, the greatest Russian writer of the period, presented two plays of the life and times of Ivan the Terrible; and Sergei Eisenstein, the most prominent Russian motionpicture director, staged a lavish film on the life and historical role of the tsar. Much publicity was devoted to inculcating in the Russian masses appreciation of this ruthless but highly successful Russian ruler, one of the greatest empire builders of all times, who pushed the Russian frontiers far east into Siberia and west to the Baltic sea. It was characteristic that in the play as well as in the motion picture Ivan's religious fervours were treated with utmost respect and that church music played a great part in Eisenstein's film.

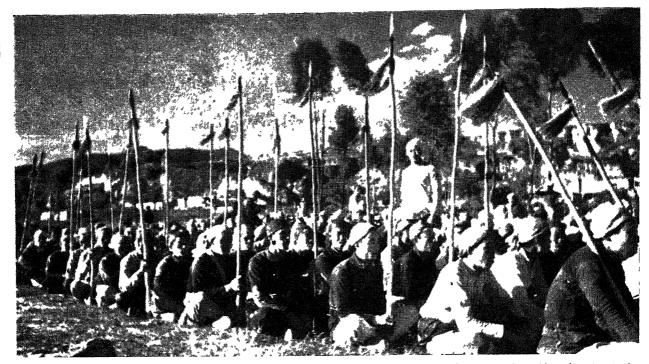
National achievement replaced class origin as the basis for evaluation of figures and movements of the Russian past. The young guerrilla heroine-martyr Zoya Kosmodemyanskaya, an 18-year-old girl, venerated by the soviet youth, had studied Ilya Muromets and other ancient heroes of Russian ballads as her inspiration.

As the communist government mobilized the forces of nationalism for its purpose, so it mobilized also the religious and patriotic feeling of the Russian church. Although religious worship had not been forbidden formerly, religious education was strictly prohibited and the soviet government officially sponsored a violent antireligious propaganda. Now this propaganda of the "Union of the Godless" ceased, its publications disappeared, the clergy received civil rights, and the role of religion in the history of the Russian nation was appraised positively.

In Sept. 1943, the Russian Orthodox Church was officially recognized. Metropolitan Sergei of Moscow returned to Moscow from his semi-exile in a special train and was received by Stalin together with other high church digni-

Communist campaign poster in Tokyo prior to the parliamentary elections of April 10, 1946. Five communists won seats, including two of the party's leaders





Chinese communists at a base in northern China listening to instructions from one of their officers during 1945. Troops of this unit wore no regular uniforms and were armed with iron-tipped spears

taries on Sept. 4. The next day all Russian newspapers gave front page prominence to the announcement that the government would place no obstacle in the way of a permanent organization of the church under a patriarch of all Russia and of a re-established Holy Synod. Consequently Sergei was elected patriarch of all Russia and was installed on Sept. 12 in a brilliant ceremony in Moscow cathedral. All metropolitans and bishops of the Orthodox Church participated in the ceremony. The patriarch assured the government of the full support of the Russian Church for the war effort. This reconciliation of the Stalinist state with the Orthodox Church was only one of the many indications that the new Russia fully accepted and revalued all the Russian national and imperial traditions of the past. Seminaries for priests were opened; the Russian interests in Orthodox religious property in Jerusalem were stressed. Orthodox priests were allowed to carry on proselytizing work both in churches and outside, and when Patriarch Sergei died in May 1944, his successor Alexei, the metropolitan of Leningrad and Novgorod, praised Stalin as "a wise leader, placed by the Lord over our great nation."

At the beginning of Feb. 1945, Alexei was crowned Russian patriarch. Under his leadership the church collaborated closely with the Russian government and with the government council for Orthodox Church affairs whose chairman was George Karpov, a high communist official. All churches were ordered to offer prayers "for the health and well-being of the God-sent leader of the peoples of our Christ-loving nation." All Orthodox churches everywhere were to be united under the leadership of Moscow. The patriarch himself, at whose coronation the patriarchs of Alexandria, Antioch and Georgia participated. visited the near east-Damascus, Jerusalem and Alexandria -to renew the ties which had existed in the time of tsarist Russia. Orthodox churches which had split away from the Moscow patriarchate abroad were warned to re-enter. The metropolitan council of the Russian Orthodox Church in the U.S. refused to accept the conditions laid down by the patriarch for reunion, because they suggested "the high handed methods of an autocratic bureaucracy." The Russian Orthodox Church in the U.S. was to continue as a U.S. church and therefore was obliged to reject the patriarch's demand to express loyalty to the soviet government.

The revival of Russian traditionalism and the new emphasis on Russian nationalism, determined also the transformation of the communist army, diplomatic service and educational system. The change from the revolutionary attitude of Leninism to the emphasis on tradition was complete in all these fields. Stalin, who a few years ago had been simply Comrade Stalin, assumed the title of marshal and later generalissimo, and dressed in a new ornate marshal's uniform. The Russian army tried to build up a strong traditional sense in the army officer corps. General, of the tsarist past, and great tsars themselves were held up as examples. There was no stress put on revolutionary or working class heroes. The officers received back their massive gold shoulder epaulets of tsarist time, distinguishing them more clearly from the rank and file than even in the democratic armies, and generals wore again the striking red stripes on the sides of their trousers. Military discipline was strictly enforced, and the standard of saluting in the Red army was unusually high. The former system of orderlies for officers was re-introduced, to take care of the officers' personal affairs, food, clothing and boots.

These changes in the army were paralleled by changes in the diplomatic service. Communist diplomats formerly appeared in simple dress. In 1943 they received ornate gold-brocaded uniforms which they wore at the 26th anniversary celebration of the communist revolution. The new splendid formal attire again stressed the resemblance with tsarist days. In the field of education, coeducation was abolished in secondary and elementary schools, to take into account the different nature of the two sexes; the boys were to be trained for a stern soldier's life while the girls were regarded essentially as the future mothers. Mili-

tary experts were to conduct drills for the premilitary age in the schools, and the teaching of Russian history and strict discipline of conduct were to be emphasized. This new stress on the difference of the sexes, on motherhood, family and authority, was again a complete departure from the original communist attitude.

There was also an official revival of the expansionist ideas dominating the Russian empire of the tsars, including pan-Slavism. An all-Slav committee was formed in Moscow and held its third meeting on May 9, 1943, with delegates of all Slav peoples participating. From Moscow, all Slavs were summoned to the fight of Slavdom against the Germans. A new monthly called Slavyane or Slavs began its publication in Jan. 1943.

With this new emphasis on Russian traditional nationalism went a stricter application of the authority of the family. Already in 1936 allowances for large families had been introduced, abortion abolished and divorce made more difficult. By the laws of July 8, 1944, this trend was confirmed. To encourage a high birth rate, a "mother-hood medal" and an "order of glorious motherhood" were newly created, and the title of Mother Heroine was introduced. Unmarried women were to get special allowances for their first child, married women much larger allowances for their fourth and all subsequent children. Birth control was no longer even mentioned, and higher taxes were levied on childless persons. Though divorce was still legally allowed, it was made much more difficult and more expensive. Both parties had to appear and to argue

British communists painting a huge propaganda poster in London during 1942, showing Hitler fighting the Russian bear as the English bulldag strained at the leash. The slogan read "Let Go That Chain" before courts. If the lower court did not succeed in reconciling the couple and believed that there were sufficient reasons for divorce, it passed the case on to a superior court which alone could decide. These financial and legal difficulties made divorce practically prohibitive except for the wealthiest and most patient persons. All free love or common law marriage was sternly discouraged.

The trend toward nationalism was further evident in the dissolution, on May 22, 1943. of the Communist International (Comintern), founded by Lenin in 1919.

The Communist parties outside the soviet union followed a similar "nationalist" or "patriotic" line, at least as long as that seemed advantageous for the co-operation of their country with the soviet union. On May 22, 1944, the U.S. Communist party became a Communist Political association, with Earl Browder as its first president who, in addressing the convention, used the greeting "ladies and gentlemen" instead of the former official "comrades." The resolutions adopted deprecated class war and stressed national unity. All strikes in wartime were violently opposed; during the elections the Communists supported President F. D. Roosevelt. They affirmed their willingness to work within the traditional U.S. system of two parties and free enterprise. The Young Communist league transformed itself in Oct. 1943 into the American Youth for Democracy and tried to enlist U.S. college youth for soviet "democracy." In France communist leader Maurice Thorez returned home from exile in Moscow after a general pardon for military desertion and exhorted the





Earl Browder greeting delegates to the Communist party convention in New York city, May 20—22, 1944. Delegates voted to dissolve the party but re-formed into the Communist Political association. In July 1945, however, the association voted unanimously to disband and reorganize once more as the U.S. Communist party

French people to think of nothing but the successful prosecution of the war and the creation of a strong French army. In Italy and in Rumania the communist leaders supported, in the interests of the war, national unity and the monarchy, and were willing to serve under conservative leadership. On the other hand, in Yugoslavia, the communist-inspired movement of Marshal Tito began to dominate more and more the political scene and to assume the leadership of the nation. In China the central government under Generalissimo Chiang Kai-shek and the Chinese communists under Mao Tze-tung could not reach a common agreement in spite of the fact that Americans, especially Major Gen. Patrick J. Hurley, then U.S. ambassador to China, tried several times to press for such an agreement. The communists were ready for an agreement in the interests of a vigorous prosecution of the war against Japan, provided that the government in Chungking would abandon the one-party system. It is interesting to note that while the communists in Russia maintained a strict one-party rule, they seemed to favour democracy outside Russia and demanded from Chiang Kaishek the abandonment of a policy followed much more consistently and ruthlessly by communists in Russia.

The end of World War II brought a new emphasis on Russian history, as evidenced by Stalin's victory address to the Russian people on Sept. 2, 1945, after the conclusion of the brief war against Japan. Russia's participation of only a few days brought her vast strategic and economic gains and restored the pre-1904 position of tsarist Russia. In that address Marshal Stalin declared: "The defeat of Russian troops in 1904 in the period of the Russo-Japanese war left grave memories in the minds of our peoples. It was as a dark stain on our country. Our peoples trusted and awaited the day when Japan would be routed and the stain wiped out. For 40 years have we, men of the older generation, waited for this generation, for this day. And now this day has come."

This statement was the more surprising because Russian socialists had always condemned the Russo-Japanese war of 1904 as a wanton act of Russian imperial aggression which had paved the way for the Russian revolution of 1905. This attitude against far eastern Russian imperialism was firmly held by the communists until World War II. The History of the U.S.S.R., a high school textbook published by the Institute for History of the Academy of Sciences of the U.S.S.R. in its 1941 edition described the war as "predatory," and declared that Lenin had worked for a tsarist defeat. "In one of his leaflets against the war Comrade Stalin wrote about the necessity of defeat: 'Let us wish that this war will become a still greater disaster for the tsarist regime than was the Crimean war. . . . Then serfdom was ended. Now, as a consequence of this war, we will bury the child of serfdom, the tsarist regime with its stinking secret police and gendarmes."

An assembly of priests of the Uniate Church of the western Ukraine delved even farther back into the 16th century to justify communist policies. In a letter to Marshal Stalin in March 1946 they wrote: "Three hundred fifty years ago the imperialist Poland of the gentry, striving to increase their enslavement of Ukrainian land that had been forcibly separated from their mother country, also broke the religious and church unity of those lands with the East of the same race and religion with the help of proud and power-loving Rome, which had always dreamt of its own dictatorship in the Christian world." Then when under Stalin's leadership the Red army had conquered all the Ukrainian lands, the assembly decided to abolish the union with the Vatican and to return "to the bosom of the Holy Orthodox Church."

Return to Marxism and Leninism.—In spite of this emphasis on the Russian past, which had been found most helpful during World War II, the Communist party in Russia at the end of the war called for a new devotion to the Marxist-Leninist doctrine. The party had grown to a membership of 5,800,000 by April 1945, as compared with about 3,500,000 in 1940. Most of these new members who came from the Red army were not sufficiently prepared in Marxist theory, and the old party members had by necessity neglected indoctrination during the war. The war had at the same time resulted in a growing contact with the outside world and its ideas which made the development of "deviations" or "heresies" within the party possible.

This shift to a new emphasis on party ideology made itself felt also in the Communist party of the U.S. The April 1945 issue of *Cahiers de Communisme*, the official organ of the French Communist party, published an article by the party secretary, Jacques Duclos, against the

"rightist" deviation of the U.S. communists under the leadership of Earl Browder. Browder, after the conference of Tehran, had abandoned class war and came out for collaboration with progressive capitalism, forming a broad national unity in the U.S. The 7,600-word article with its bitter attacks upon Browder and the policy of U.S. communism, which was accused of having "swerved dangerously from the victorious Marxist-Leninist doctrine," was reprinted in The Daily Worker by Browder, its editor, and became immediately the guiding principle of communist policy in the U.S., which made a sharp and abrupt turn back to class war. The Communist party was reconstructed, Browder was stripped of his authority and replaced by William Z. Foster as the new leader of the party. A special convention at the end of July unanimously endorsed the new leftward trend. The April issue of Cahiers de Communisme had declared: "Today as in the past, the ultimate goal of the communists is the same.'

This reversal of Browder's policy and the return to the former irreconcilable militancy revived all the former slogans. Thus Benjamin J. Davis, Jr., communist member of the New York city council, wrote in *The Daily Worker* that under Browder's influence he had misinterpreted the party's policy for the American Negroes. The former official communist policy was now revived; it demanded that in the so-called "Black Belt" Negroes should be given complete right of self-determination and even the right of secession from the U.S.

In Jan. 1946 Browder, who formerly had been enthusiastically and unanimously regarded as the great leader and the shining symbol of American communism, was expelled from the party. The party was called to a pitiless struggle against Browder and Browderism.

The events of 1945 and 1946 did not establish clearly how far communism was sweeping Europe. In many European countries communists formed part of government coalitions and held important positions in the cabinets. The governments of Poland, Yugoslavia, Rumania and Bulgaria were controlled by communists and no opposition to the governments in power was allowed, though it is very doubtful how far the communists and their policies were approved by the people. Communists made a very good showing at free elections in Czechoslovakia and France, though they did not achieve a majority; in other countries with free elections they increased their vote without, however, becoming an important element (Norway, Denmark, Netherlands, Belgium); while in such countries as Great Britain and Austria they made a surprisingly weak showing. In Germany the communists were officially supported in the Russian occupied zone and formed there a unity movement with the social democrats. Interestingly enough, their main slogan was a chauvinistic insistence on German centralized unity so that they became the foremost spokesmen of a renewal of German greatness. They also frankly accepted many former national socialists into their ranks, the "repentant nazis," and sought the closest collaboration with men in the German arts, letters and sciences in spite of their former affiliation with activities under the third reich.

The chaos which resulted from the sudden collapse of Japan's far-flung armies in Asia seemed to facilitate the growth of communist influence. It played an important role in the nationalist and agrarian movements in the Philippine Islands, in Indonesia, in Indo-China and in Burma. In China the powerful Communist party, which maintained its own large armies and controlled from Yenan vast parts of China, opposed the legitimate government of the Chinese republic, which was recognized by

the U.S., the U.S.S.R. and the United Nations. The Chinese government objected to the existence of an armed faction in the country which threatened the nation with a civil war. The most important bone of contention was the control of Manchuria, whose conquest by Japan in 1931 had started the wave of aggression and whose resources made it the most important part of the far east—the only one which could serve as a base for large scale industrialization. Under these conditions the Chinese government did not wish to lose Manchuria, over which it had been at war with Japan for so many years.

In Latin America the Communist parties were exceedingly well organized and followed inflexibly the Moscow line. After the end of World War II they revived all the old slogans against "war-mongering Yankee imperi-They had become especially strong in Chile, where they gained control over the workers in the vital shipping and mining industries; in Brazil, where their leader Luis Carlos Prestes came to the fore in 1946 and where their candidate in the presidential elections of 1945 received 600,000 votes; in Cuba, where they demanded above all the evacuation of the U.S. bases there; and in Mexico, where the C.T.M. (Confederacion de Trabajadores Mexicanos) was under the leadership of Vicente Lombardo Toledano, who also created in 1938 the Union of Latin America Workers (C.T.A.L. or Confederacion de Trabajadores de America Latina).

An important advance in communist influence in the international labour movement was achieved with the formation of the new World Federation of Trade Unions (q.v.), in Paris, France, in the fall of 1945. The International Federation of Trade Unions, which had been founded in 1901 and reconstituted in 1919, and did not admit communist and Russian trade unions, was dissolved. Its place was taken by the new organization in which the Russian trade unions participated and where many other national trade unions showed a strong communist influence. President of the new organization was Sir Walter Citrine (Great Britain) while its general secretary was Louis Saillant, a French trade unionist with communist leanings. Of the U.S. trade unions, the American Federation of Labor refused to join the new body, while the Congress of Industrial Organizations under Sidney Hillman took a very active part in its organization. (See also CIVIL LIBERTIES; DEMOCRACY; FASCISM; PHILOSOPHY; So-CIALISM; UNION OF SOVIET SOCIALIST REPUBLICS.)

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Community Chest

The ten years 1937-46 were years of important growth for the community chest and united community planning,

budgeting and fund-raising for local health and welfare services. This growth was marked by a notable increase in numbers of chests and amounts raised, and a parallel advance in fundamental thought underlying federated planning and financing of health and welfare services. The accompanying table shows the expansion in terms of numbers of chests and amounts raised during the decade 1937–46.

Funds Raised by All Recorded U.S. Chest Campaigns, 1937-46

Year													Number of campaigns	Amount
1937													452	\$ 81,707,787
1938													475	83,898,234
1939													523	82,771,362
1940													561	86,297,068
1941					٠								598	90,379,099
1942													632	104,575,890
1943													649	162,334,486
1944					٠								703	210,41 5, 18 7
1945													<i>7</i> 72	221,272,950
1946	٠	•	•			٠		•	•	٠			798	197,048,839

The community chest idea gained great impetus during World War I, when war chests were created throughout the United States to raise huge sums for human needs in the United States and overseas. In 1918 a small group of local leaders, foreseeing that the effectiveness and economy of united campaigns would appeal to the people of the United States in peace as in war, organized their national association, Community Chests and Councils, Inc., to be a clearinghouse of information, ideas and services to local chests and councils of social agencies, and to serve as their spokesman among other national bodies.

From 1932 until the organization of the National War fund in 1942, Community Chests and Councils, Inc., conducted an annual Mobilization for Human Needs. This was not to raise money nationally, but to focus attention on local chest campaigns throughout the nation and inspire people to support them.

With the outbreak of World War II in Europe, the number of appeals for war relief funds increased rapidly, and it became evident that something should be done in the way of united planning, budgeting and money raising. In 1942 a three-way co-operative agreement with respect to the support of local campaigns was worked out between Community Chests and Councils, Inc., the United Nations Relief committee of the American Federation of Labor and the Committee for American Allied War Relief of the Congress of Industrial Organizations. That same year Community Chests and Councils set up a National Budget Committee for War Appeals, and worked out a quota plan for the guidance of local communities in estimating their share of the amount needed.

In Jan. 1943, at the specific request of the President's War Relief Control board, the National War fund was organized to secure funds through local war chest appeals and also in smaller communities where no war chests existed. Included in the National War fund were the United Service Organizations, the United Seamen's service, War Prisoners Aid and 19 organizations sponsoring relief to foreign countries. Community Chests and Councils, Inc., assisted in the organization and operation of the National War fund through temporary loan of staff, participating in policy-forming and committee work and co-operative publications and activities. The budget and quota systems developed earlier by Community Chests and Councils, Inc., were adopted by the fund.

Most community chests became war chests. The total raised by community chests during four wartime campaigns was \$790,000,000, of which \$534,000,000 went to

health, welfare and recreation services in the United States, and approximately \$256,000,000 to national and international war appeals such as the U.S.O. and foreign war relief agencies. During three of the war years the community chests, operating as community war chests, appropriated more than \$195,000,000 to the National War fund, or about 60% of all the money raised by that organization.

Trends.—Accompanying the physical growth of the chest movement were the following basic trends in thought: A reaffirmation of faith in the principle of federated financing as a sound, democratic and efficient way to support voluntary community health and welfare services. Federation had been found to suit the mood and tempera-

ment of the U.S. people.

A strengthened conviction that money raising could not and should not be divorced from social planning. It was necessary for a community chest to assume responsibility for seeing that funds raised were spent wisely and fairly in the public interest. Inevitably, this led chests to accept more and more responsibility of planning for the health and welfare of the whole community. Sometimes this planning function was carried by the chest alone, sometimes by a separate council of social agencies, sometimes by a combined chest-council.

A similar conviction that the chest should continually grow as a broadly inclusive and democratic movement with all groups of citizens and community interests participating in its fund-raising activities.

A new realization that gifts to a chest were not "charity for the down-and-out" but community services, supported and used by people from all ranks of community lile. One evidence of this fact was the broad base of financial support enjoyed by chests (21 gifts per 100 persons in 1946). Another was the wide extent to which the services of chest member agencies were used by the citizens of a community. A study in Dayton, O., for example, revealed that 40 out of every 100 families had used the services of chest agencies that year. This new conception of the functions of chests was expressed in the theme of the 1946 campaigns, "Everybody Benefits—Everybody Gives."

A growing sense of national unity among chests and councils. In 1945 the name, "community chest" was officially adopted, and the red feather was chosen as the national campaign symbol. After the last campaign of the National War fund in the fall of 1945, local community chest campaigns were united for the first time under the name Community Chests of America, sponsored by a citizens committee representing all sections of the United States. This sense of unity, felt locally, was expressed nationally through certain actions taken by Community Chests and Councils, Inc., notably the following: (1) the creation of a National Budget committee to consolidate the budgeting lessons learned during wartime; (2) the creation of an Advisory Committee on Volunteer Service to promote the idea of volunteer service as "citizenship participation" in democracy, and to help local communities in their efforts to recruit and train volunteers and direct their skills into useful community peacetime service; (3) the creation of a new department on labour-employee participation in recognition of the greatly increased participation by labour in local planning and fund-raising. (See also Relief; WAR Relief, U.S.)

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Community Trusts

At the start of the decade 1937–46, community trusts were still within the initial quarter century of their existence. The first of them, founded in Ohio in 1914, was the conception of F. H. Goff, banker and lawyer of Cleveland. In both his legal and financial activities, he had sought a medium of managing charitable funds that would combine factors of permanence, safety, flexibility and public participation. His conception materialized in the Cleveland foundation, and from there the idea spread to other cities.

In the 23 years following 1914, community foundations accumulated revenues of \$46,300,000 and were disbursing, in 1937, more than \$1,000,000 yearly.

Their roots, moreover, were strong, as the succeeding decade proved. The principal held by community trusts mounted to approximately \$75,000,000 at the end of 1946, and they were annually disbursing upward of \$2,000,000. In this ten-year span, the active—eliminating the "deferred"—funds of the New York Community trust rose from \$3,800,000 to \$17,000,000; those of the Chicago Community trust, from \$5,500,000 to \$9,600,000 and those of the Cleveland foundation, from \$3,800,000 to \$6,800,000. In that period, community foundations paid out \$17,500,000—\$4,000,000 of it from the New York organization, \$2,300,000 from Chicago, \$2,200,000 from Boston and \$2,100,000 from Cleveland.

Current receipts of these trusts rose similarly. The aggregate of their incoming funds was \$2,400,000 in 1937 and \$5,300,000 in 1945.

The number of community trusts continued to enlarge. During the 1937–46 decade, foundations were created in 16 cities—including, in the last three years of the decade—Columbus, Ohio, Spartanburg, N.C., Rochester, Minn., Champaign, Ill., Mt. Vernon, O., Pittsburgh, Pa., and Wilmington, N.C.

At the beginning of that ten-year interval, community trusts in possession of principal funds numbered 54, of which 42 were making periodical distributions. At its close, 65 trusts were holding funds and 54 of them were disbursing regularly.

The role of benefactions of modest size had long been emphasized by community foundations, but a late development was the creation of common funds, exemplified by the "Combined Fund" in the Cleveland foundation and the "Composite Fund" in the New York Community trust, permitting still smaller gifts to have the benefits of trust administration.

The objective of community foundations continued to be provision of a medium of administering multiple funds of varying sizes from diverse sources and for differing charitable uses. Customarily, the principal of a fund was held by an institutional trustee selected by the founder, and the distributable proceeds were allocated by a committee of citizens selected for their acquaintances with charitable needs. A minority of these were usually chosen by the trustee banks, and a majority by such public sources as the mayor, federal judiciary, probate or surrogate courts, presidents of the bar association, medical academy, etc.

If literal and continuing adherence to some portion of a program became ultimately impossible or impracticable in the judgment of the Distributing committee, it was empowered and instructed by the founder to take such remedial action as was required or appropriate in the light of the new conditions. The effect sought, in the words of Newton D. Baker, was "to substitute contemporary wisdom for foresight." A distinctive feature of a community trust, apart from providing a framework for the administration of a multiplicity of charitable funds, was this flexibility that gave promise of corrective action if an originally designated object became nonexistent or obsolescent.

The practical operations of these foundations could be illustrated, in general, by those of the New York Community trust. Sixteen fiduciary institutions adopted an identical basic "resolution and declaration" agreeing to accept, as trustees, funds to be held in accordance with its terms. The terms of that resolution were made a part of each will or trust deed creating a fund within the community trust. A bank or trust company receiving property so trusteed became responsible for its fiscal management; but all charitable appropriations had to be authorized by the central Distribution committee, five members of which were named by the associated trustees and the remaining six by the senior judge of the federal circuit court of appeals, the mayor of New York, and the presidents of the bar association, academy of medicine, chamber of commerce and Brooklyn Institute of Arts and Sciences.

The trustee chosen by a founder to hold his fund, controlled its investment and periodically reported on its status to the trust's Distribution committee, which instructed the trustee concerning outpayments. In so doing, the committee acted for the founder in giving effect to his expressed preferences or in exercising the discretionary authority vested in it by him.

A founder might name his fund, direct whether principal as well as income should be expended, and state his desires concerning specific charitable purposes to be assisted. The Distribution committee undertook to carry out those desires, subject always to its being empowered to amend them if, in the course of time, they became obsolete. Within the New York Community trust, upward of 75 funds were being administered at the end of 1946, and \$600,000 was annually paid out. (See also Donations and Bequests.) (R. Hs.)

Composers, Authors and Publishers, American Society of

See Music; Societies and Associations.

Compton, Karl Taylor

Compton (1887-), U.S. physicist and educator, was born Sept. 14, 1887, at Wooster, O., the son of a clergyman and college professor. Both Karl and his two brothers became college presidents, with Karl as head of the Massachusetts Institute of Technology; Arthur as chancellor of Washington university and Wilson as president of Washington State college.

Karl Compton was graduated from the College of Wooster with a degree of bachelor of philosophy in 1908. He received his degree of doctor of philosophy from Princeton university in 1912; he taught physics at Princeton from 1915 to 1930 and was chairman of the department of physics from 1929 to 1930.

His most important scientific contributions were in the field of thermionics, the study of electronic emission from hot filaments and in spectroscopy (the investigation of matter by means of light waves).

As president of Massachusetts Institute of Technology after 1930, he greatly broadened the curriculum and intro-

duced a five-year plan of study that was designed to give students an insight into social and economic implications of their future professions.

Active in both World War I and World War II he served with the army signal corps in the first conflict, specializing in development of submarine detection devices. In World War II he served on various governmental committees and was associated with the original atomic bomb project. In 1946 he was appointed by Pres. Harry S. Truman to serve as a member of the president's personal committee on the atomic bomb tests at Bikini; he also was a member of the joint chiefs of staff evaluation board. In the post-Hiroshima discussions on atomic energy and defense Dr. Compton supported the president's plan for one year of military training for 18-year-olds, declaring (Nov. 21, 1945) that sneak attacks by atomic bombs would not be decisive, but an invasion following such attacks might defeat the U.S. if it did not have trained reserves.

Dr. Compton did not support the McMahon bill for placing atomic energy in civilian hands, declaring that he personally favoured the May-Johnson bill, which put control in military hands. He also favoured continued federal support for organized scientific research.

Compulsory Service, British

A step unprecedented in the history of Great Britain was taken by the government in the early part of 1939 when, owing to the menacing situation in Europe, a bill providing for a system of compulsory military training was introduced into parliament and passed. The Military Training act came into operation on May 26, 1939, and provided for the registration, medical examination and calling-up for training in the royal navy, army or royal air force of men aged 20. A special feature of the act was that the processes under it were carried out by a civil department of state, namely, the ministry of labour.

Only one registration took place under the Military Training act, which was superseded on the outbreak of war by the National Service (armed forces) act, 1939. This act was based on the Military Training act and passed through all stages in both houses of parliament on Sept. 3, 1939, the day on which war with Germany was declared.

The National Service act made all men from 18 to 40 years of age inclusive liable to be called up for service in the armed forces. Men were registered by successive age classes at the employment exchanges of the ministry of labour. At the time of registration they were permitted to express a preference for service in the royal navy, the royal marines, the army and the royal air force. While men were called up to the service of their choice wherever possible, this could not always be done, as the demands of the various services did not always coincide with the numbers available.

The next step in the process of calling-up was to differentiate between those whom it was necessary to retain in civil life on vital war production and those to be called up for the armed forces. The instrument used in the first place for deciding this and adjusting the balance between the requirements of the forces and the needs of essential civilian industry and services was the Schedule of Reserved Occupations. This consisted of a schedule of occupations with ages of reservation attached to each occupation. In general, men below the age of reservation for their occupations were called up for military service; those at or above the age of reservation were retained in industry. Alterations were made from time to time in the ages of reserva-

tion of the various occupations to accord with changing military and civil requirements. In order to meet exceptional cases in which it was not in the national interest that a man below the age of reservation in his occupation should be withdrawn from his civilian employment for military service, deferment of calling-up was granted. This system was sufficient for the first 18 months of the war, but by the end of 1941 it became necessary, owing to the increasing shortage of manpower in Great Britain, to examine the case of every reserved man to ascertain whether his retention in his existing employment was necessary in the national interest. This was done by raising the age of reservation for nearly all occupations by monthly steps of one year beginning on Jan. 1, 1942, exception being made in the case of men employed in certain services such as the merchant navy, civil defense, national fire service, royal observer corps and police. As men became dereserved, their cases were considered for further deferment by district manpower boards, 44 of which were created in various parts of the country and started work at the beginning of Jan. 1942. The system of reservation by occupations was thus gradually changed to a system of individual reservation.

Men not reserved for industry were called for medical examination by a medical board set up under the National Service act. Each board consisted of four doctors, who were required to grade men in one of the four categories, I, II, III and IV. Normally, only men in grades I and II were called up. Those passed as medically fit for service in the forces formed the reservoir from which men were called up in the numbers required to meet the needs of the armed forces. In allocating men to the various branches of the forces account was taken of age, physical and mental standard and civilian occupation and experience. Men with certain kinds of skill were earmarked for one or other of the service trades. Enlistment notices calling men up were issued by the ministry of labour.

The National Service act made provision for men about to be called up to apply for postponement of calling-up on account of "exceptional hardship." Under the act postponement could be granted for a maximum period of six months, but it was renewable on further application. The minister of labour had power to grant postponement, but where he did not grant an application it had to be referred to a Military Service (Hardship) committee, consisting of an independent chairman, a representative of employers and a representative of workers. In certain cases there was a right of appeal to an umpire whose decision was final.

Provisions for the reinstatement in their civil employment of men called up for service in the armed forces were contained in the National Service act. These were subsequently replaced by the Reinstatement in Civil Employment act, 1944, which extended and amended those provisions and came into operation on Aug. 1, 1944. In general, the Reinstatement act provided for the reinstatement, in their previous employment, of persons released from the forces, whether volunteers or conscripts, in the position they would have been in had they never been called up.

The National Service act made provision for conscientious objection. A man who alleged that he was a conscientious objector had to establish his case before a public tribunal which had power to direct (a) that the applicant should be registered without conditions as a conscientious objector; (b) that he should be registered as a conscientious objector on condition that he undertook work of a civil character under civil control specified by

the tribunal; (c) that he should be called up for noncombatant duties in the forces. If the tribunal considered that an applicant had not established his case, the man then became liable to be called up for service in the armed forces in the ordinary way.

In April 1941 the National Service act, 1941, extended the liability of men to be called up to the armed forces to a civil defense force, that is, the police war reserve, national fire service and civil defense reserve. Accordingly, as from April 1941, new registrants under the National Service acts above the age of 30 at registration, and men becoming de-reserved under the revised Schedule of Reserved Occupations who were at or above the age of 25 on their prescribed registration day, were permitted to express a preference for a civil defense force. Postings to the police war reserve were virtually discontinued in Dec. 1942, to the national fire service in July 1943 and to the civil defense reserve in Oct. 1944.

In addition to the powers contained in the National Service act, 1941, enabling the minister to call up men to the police war reserve, national fire service and civil defense reserve, the minister of labour also had power under defense regulations to direct men and women to enrol in the other civil defense services, royal observer corps and special constabulary, either whole time or part time. Up to the beginning of Sept. 1944, after which directions were suspended, some 496,000 directions were issued for part-time service. By order in council made in Jan. 1942, the minister of labour was given power to direct men to join the home guard which, under the title of local defense volunteers, was formed in May 1940. By the beginning of Sept. 1944 about 916,000 had been so directed.

The issue of directions to persons to enrol in the home guard was suspended in Sept. 1944. Later in the year the home guard was stood down; it was disbanded on Jan. 1, 1946.

After Sept. 1942, young men under 25 years of age who became available for posting to the armed forces were given an option of taking up underground employment in coal or other mining. In July 1943 this option was extended to fit men of effective military age subject to certain exceptions. After Dec. 1943 men were selected by ballot for direction to coal mining from among young men up to 25 available for military service. Exclusion from the ballot was limited to three classes:—(1) men accepted for flying duties in the royal air force or fleet air arm; (2) men accepted as artificers in submarines; and (3) men in a short list of highly skilled occupations who were called up only as tradesmen in the armed forces. Recruitment for coal mining by means of the ballot was discontinued in May 1945.

In Dec. 1941 the National Service (No. 2) act, 1941, was passed, increasing the military age up to and including 50 years of age. A year later, in Dec. 1942, the National Service act, 1942, reduced to 17 years 8 months the age at which men could be registered, although the age at which a man became liable to be called up for service in the armed forces continued to be 18 years. The registration of the 20 age-class in June 1939 was followed by the registration of successive age-classes up to 40. By the end of the war in Aug. 1945 all men born between July 1, 1900, and Sept. 30, 1927, had been registered under the National Service acts, the total numbers so registered amounting to 8,350,000. Fit men aged 18 to 40 inclusive not reserved or deferred were called up to the armed forces or the civil defense forces. As regards men above the age of 40, only doctors and dentists in the age-classes

41 to 45 (inclusive) were called up. The total number of men called up under the National Service acts from June 1939 to Aug. 1945 was 3,040,000.

In addition, about 2,000,000 men were enlisted as volunteers in the armed forces.

Women were made liable to be called up for service in the women's auxiliary services and the civil defense forces by the National Service (No. 2) act, 1941, the first time in the history of Great Britain that women had been conscripted. Women so called up were given the same statutory protection and safeguards as were enjoyed by men, as regards conscientious objection, postponement of callingup on grounds of exceptional hardship and reinstatement on discharge from the forces. Women called up under the act were in the first instance allowed to express an option for the women's auxiliary services, civil defense, or such specified civilian jobs as the minister of labour from time to time directed. The civil defense option was subsequently withdrawn, and women called up were given a choice between the women's services and certain civilian employments. From Jan. 1944, owing to the pressing needs of industry, the forces option was suspended, and women who became available for calling-up were all allocated to priority civilian employment. Married women and women with children of their own under 14 years of age living with them were exempted from compulsory service in the women's auxiliary services and civil defense forces. Women called up for the women's auxiliary services were required to use lethal weapons only if they volunteered to do so. So far as was practicable, women called up to the services were posted to units near their homes.

The scheme for registration by successive age-classes, medical examination and call-up was the same for women as for men. There was, however, no Schedule of Reserved Occupations for women, but women who were engaged in certain vital war work or service were regarded as reserved from calling-up. The list of occupations and services from which women were not called up was revised from time to time. Other women had their calling-up deferred if they were engaged on work of importance to the war effort. Women in the age-classes 18 to 50 inclusive were registered for national service, but only those in the age-classes 19 to 24 were compulsorily called up for service in the women's auxiliary services and civil defense forces. Women in the other age-classes were called up for transfer to vital war work.

Recruitment for the women's auxiliary services by means of compulsory call-up came to an end in Jan. 1944. Between Jan. 1942 and that date about 126,000 women were called up. Only 2,000 women were posted to the civil defense forces. (See also British Women's Services, World War II.)

The National Service (Foreign Countries) act, 1942, enabled certain British subjects, men and women, in foreign countries to be called up for military service. An order in council was made on Aug. 6, 1942, applying the act to Egypt, as a result of which a system of compulsory service for British subjects in Egypt became operative.

The Allied Powers (War Service) act, 1942, gave the minister of labour power to make orders in council imposing on men of military age of any Allied nationality a liability to be called up to the British armed forces if they had not within a specified period joined their own national forces. By an order in council made on March 11, 1943, the nationals of those Allied Powers whose governments were at that time temporarily established in the United

Kingdom and who possessed national armed forces were made liable under the act. These Allied powers were Belgium, Czechoslovakia, Greece, the Netherlands, Norway, Poland and Yugoslavia. Further orders in council on Aug. 10, 1944, applied the provisions of the act to nationals of France and the U.S.

Dominion and other British subjects from overseas, who had been resident in Great Britain during any continuous period of three months, were made liable to military service in the British armed forces by the Defense (National Service) regulations, made on Jan. 20, 1944. The regulations included nationals or citizens of Canada, Australia, New Zealand, Newfoundland, the Isle of Man, Channel Islands and of any colony, protectorate or mandated territory under the crown.

The peak of the mobilization of manpower was reached in Sept. 1943, after which the total in the forces, civil defense and industry began to decline. In spite of this, however, the intensity of mobilization for operational war purposes continued to increase, with the result that the maximum strength of the armed forces was reached on D-day and maintained at that level until the end of the war with Germany in May 1945. At D-day, more than 4,500,000 men were serving in the armed forces, compared with less than 500,000 at mid-1939. This total had been reached in spite of casualties sustained during nearly five years of war. Including the number killed, missing, taken prisoner or released on medical grounds, the total number of men who served in the armed forces during the war was about 6,000,000. Of these, 3,000,000 were called up under the National Service acts. At D-day the strength of the women's services had reached 470,000. Including casualties and those released on medical grounds, the total number of women who served in the women's services during the war was about 640,000. Of these, about 126,000 were called up compulsorily.

Following the end of the war with Germany, men and women were released under the "age and length of service" re-allocation of manpower scheme. This was initially an interim scheme for operation between the end of the war with Germany and the end of the Japanesc war. Following the collapse of Japan in Aug. 1945, this interim scheme became the demobilization scheme, under which the great majority of the men and women were released according to age and length of service (class A); a small minority were released on account of their special qualifications for urgent reconstruction work (class B). By the end of Dec. 1946 nearly 4,000,000 men and more than 250,000 women had been released.

At the same time that releases from the forces were taking place men were still being called up compulsorily. The maximum age of call-up was lowered to 30 in May 1945. As from Jan. 1, 1947, compulsory call-up was limited to young men reaching the age of 18. Those called up during 1947 would serve for a fixed period of two years; those called up in 1948 would serve for, a period decreasing from two years to 18 months.

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Conant, Gordon Daniel

Conant (1885—), Canadian politician and jurist, was born Jan. 11, 1885, at Oshawa, Ontario. He was graduated from the University of Toronto with a B.A. degree, receiving his LL.B. degree in 1912. Admitted to the Ontario bar in 1912, he practised law in Oshawa. Later he went into politics and was secretary of the Liberal association for 25 years. He was elected to the Ontario legislative assembly for the Riding constituency, Oct. 6, 1937, and was appointed attorney general for Ontario six days later. Conant succeeded Mitchell Hepburn as prime minister of Ontario, Oct. 21, 1942. Conant himself resigned the following year because of ill health and later in 1943 was appointed master of the supreme court of Ontario.

Conant, James Bryant

Conant (1893—), U.S. scientist and college president, was born March 26, 1893, in Dorchester, Mass. Entering Harvard university in 1910, he specialized in chemistry and was graduated in 1913. After receiving his Ph.D. degree in 1916 he was appointed chemistry instructor on the Harvard faculty. He served in World War I with the government's bureau of chemistry and bureau of mines, worked on war gases and was a major in the army's chemical warfare service, 1917–18. Returning to Harvard after the armistice he became an assistant professor of chemistry in 1919. By 1928 he was Sheldon Emory professor of organic chemistry.

Dr. Conant became president of Harvard in 1933. A long-time foe of narrow specialization, he fostered many educational advances at the university as well as continuing his work in his chosen field of organic chemistry. He was widely recognized for his scientific contributions, particularly for his research and investigations in regard to chlorophyll and the nature of haemoglobin. He was also a director of the Rockeleller institute, served on the government's advisory committee on cancer research and wrote many papers and books on organic chemistry.

During World War II he ran Harvard on a war basis, serving both the army and navy, and planned for postwar reconversion of the university with special attention to the needs of returning servicemen. In Feb. 1941 he went to England as head of a three-man commission to confer with British scientists on new scientific developments, including presumably knowledge gained in atomic research. That same year he was made chairman of the National Detense Research committee; in this capacity he advised and assisted the government on such top-secret matters as development of the atomic bomb.

Dr. Conant testified in opposition to the legislation calling for a year's compulsory military training for 18-year-olds. He declared Nov. 29, 1945, that development of the atomic bomb required a study of future defense needs before a compulsory military training program was adopted. With regard to the controversy regarding the atomic bomb and the soviet union he urged, Dec. 3, 1945, an immediate exchange of scientific information and scientists between the U.S. and the U.S.S.R. as the first step toward prevention of an atomic armament race. On Dec. 12, 1946, Dr. Conant was appointed by Pres. Harry S. Truman to head a general advisory committee to advise the Atomic Energy committee on scientific and technical matters.

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